

RETROSPECTIVE STUDY REGARDING OUR EXPERIENCE IN SYMPTOMATIC PLACENTA PRAEVIA

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Abstract: *Placenta praevia is a complication of pregnancy that may have dramatic maternal and fetal effect. The purpose of this study was to evaluate the incidence of placenta praevia and the management of this pathology. The study was conducted between the years 2013 and 2016. We recorded a total of 146 (0.87%) cases, with an increased frequency of placenta praevia between the age group of 30-34 years, corresponding to the maximum fertility period of the woman. Within the study group study there was a higher incidence of placenta praevia at primiparous women, with a difference of 13.7% compared to multiparous. The type of delivery was by C-section in 65.06% of the cases while 34.93% of the cases with placenta praevia gave birth spontaneously by vaginal route. The purpose of the treatment was to achieve a maximum of fetal maturity with minimal maternal and fetal risk. The gestation period was extended at 77.01% of patients under medical treatment. Worldwide, maternal mortality in cases of pregnancy with placenta praevia remains high in countries with low socio-economic status.*

Key words: *Hemorrhage, Placenta praevia, Abnormal adherence, Fetal mortality, Peripartum hysterectomy.*

1. Introduction

Placenta praevia (PP) is an obstetrical complication in which the placenta is implanted in the inferior segment of the uterus [19] and it partially or completely obstructs the cervical canal [11]. The abnormal adherence of the placenta can be classified, according to the depth of adherence of placental tissue, in three categories: placenta accreta (75% of cases) in which placental tissue invades the decidua; placenta increta (15% of cases),

in which chorionic villi reaches the thickness of the myometrium and placenta percreta (5% of cases) that exceeds the uterine serosa and invades the surrounding organs [12], [23], [28], [30]. Following the latest reports, the incidence rate of PP varies between 0.3% and 1.4 % [19] and is a major cause of antepartum bleeding [26].

The real causes of abnormal placental insertion in the inferior segment are, still, not fully known [11], but the literature studies mention the following risk factors for the occurrence of PP: multiparity,

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uterine scarring, history of placenta praevia, history of abortions and curettages, placental anomalies, maternal age. These factors promote low insertion of the placenta by the changes induced in the vegetative tonus and the peristalsis of the uterine body, maintaining the lower segment open and therefore more accessible to the trophoblast [6].

Regarding the complications of PP, the pregnant women are permanently exposed to hemorrhages [22], [35], anemia, respiratory failure, increased maternal mortality. Among neonates, the respiratory distress syndrome, congenital abnormalities and anemia are well known complications [7]. Premature birth occurs in 40% of cases of PP and premature newborns are being exposed to several risk factors [9], [20].

2. Objectives

The purpose of this study was to evaluate the incidence of placenta praevia, the management and the way of delivery in patients with this pathology hospitalized in the Clinical Hospital for Obstetrics and Gynecology Brasov.

3. Material and Methods

The retrospective study was conducted at the Clinical Obstetrics and Gynecology Hospital "Dr. I.A. Sbârcea "Brasov during

a period of 4 years. We recorded a study group of 146 pregnant women diagnosed with placenta praevia. The patients were admitted to our hospital in order to provide specialized treatment and birth assistance. Data was processed from the patients' medical records and surgical records, creating an Excel database for this purpose. Statistical and graphical data processing used Microsoft Office 2010 package.

4. Results

According to the birth rate per year, the incidence of PP was the following: in 2013, we obtained 24 cases with PP, in 2014 a total number of 36, in the year 2015, placenta praevia was noticed in 43 cases and in 2016, 43 cases of placenta praevia were admitted to our clinic. Therefore, we found a slight decrease of the birth rate in the years 2014 and 2015 and an increased incidence of PP incidence in 2015 and 2016 compared to the year 2013 (Table 1).

The age of the women included in the study group ranged between 15-41 years and we noticed a frequency of placenta praevia of 39.73% in the study group 30-34 years, corresponding to the woman's maximum fertility period. A placenta praevia during pregnancy was found in a 15-year-old adolescent and 27 cases over the age of 35.

<i>Distribution of pregnancies with placenta praevia in the period of study</i>					
Year	Total number of births	Number		Percentage (%)	
		Pregnancies not complicated by placenta praevia	Pregnancies complicated by placenta praevia	Pregnancies not complicated by placenta praevia	Pregnancies complicated by placenta praevia
2013	4327	4303	24	99.45%	0.55 %
2014	4216	4180	36	99.15%	0.85%
2015	4040	3997	43	98.94%	1.06%
2016	4035	3992	43	98.94%	1.06%

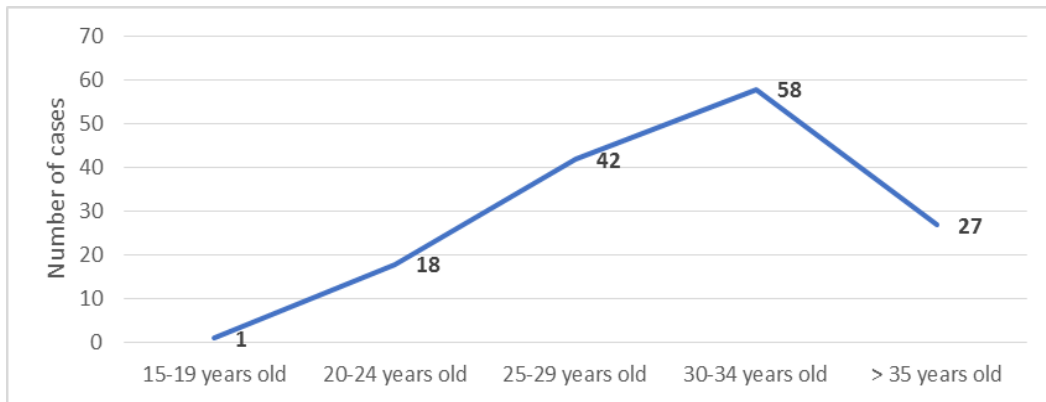


Fig. 1. Distribution by age of patients with placenta praevia

Of the total of 146 pregnancies with PP was noticed at the primiparous (56.85%) with a difference of 13.7% compared to multiparous (43.15%). A higher incidence of

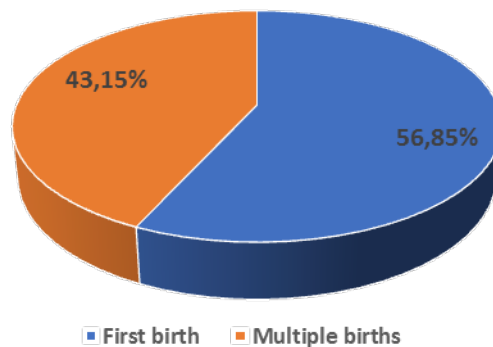


Fig. 2. Distribution of placenta praevia according to the number of births

Of the 146 pregnancies with PP, 141 (96.58%) cases had a single conception product and 5 (3.43%) were multiple pregnancies. The gender of the fetus was another criteria included in the placenta praevia incidence analysis. Our study revealed a predominance of male resulting from pregnancies with PP: 64.38% male gender versus 35.62% female gender.

Smoking is considered a risk factor for placenta praevia and from the 146 women with placenta praevia included in the study group, 24.66% were smokers and the remaining 75.34% were nonsmokers.

According to the residence areas, maternal mortality in pregnancies complicated by placenta praevia is increased in countries with poor socio-economic status while in urban areas mortality is lower by timely referral to specialized services and early establishment of treatment. In our retrospective study, the distribution of pregnancies with PP by the area of origin was higher in urban areas (69.86%) and lower in rural areas (30.14%).

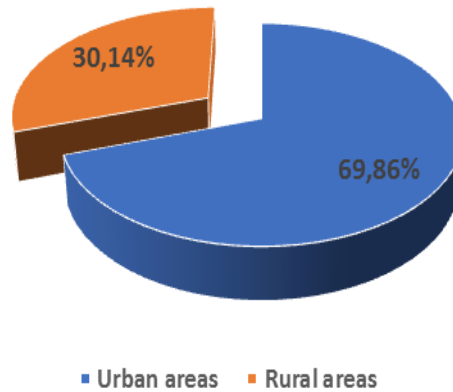


Fig. 3. *Distribution according to the environment of patients with placenta praevia*

Regarding the pathological obstetrical and gynecological antecedents, the C-section, the history of abortions and previous PP pregnancies have been analyzed. We noticed a considerable difference between the incidence of abortions (31.46%) and C-section (25.34%) compared to the incidence of abnormal placental adherence (0.56%), placental abruption (1.69%), history of placenta praevia (2.25%) and sterility (3.37%).

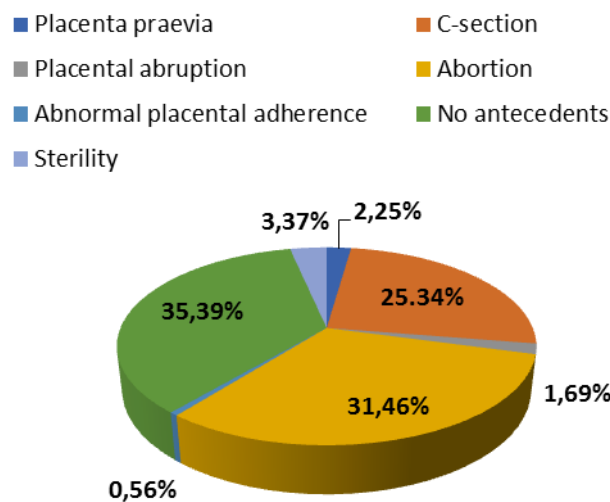


Fig. 4. *Distribution of pathological obstetrical history in pregnancies with PP*

The moment of onset of symptoms in pregnancies complicated by placenta praevia was frequently in the last trimester of pregnancy (81.51%), while in the first and second trimester the incidence was 2.05% and 16.44%, respectively. The main symptom, hemorrhage was noticed between 22-25 weeks for 4.14% of cases; between 26-30 weeks for 12.41% of patients; in the 31-34 weeks in 20.69% of

pregnancies; between weeks 35-38 in 33.79% of the pregnancies. The symptomatology of onset was for 107 cases hemorrhage (73.79%), in 18 cases preterm rupture of membranes (12.41%) and in 20 cases premature birth (13.79%).

Of the 107 cases that presented hemorrhage, 4 cases had a cataclysmic hemorrhage, but in the majority of pregnant women with PP we noticed moderate metrorrhagia (66.36%) or minimal metrorrhagia (29.91%). Preterm

rupture of membrane is a significant cause of premature birth and increases the risk of intrauterine infection. We noticed that 12.33% of the cases studied were diagnosed with rupture of membranes.

Regarding to the insertion level of the placenta, 48 patients (32.88%) had a central insertion, 21 cases were with partial central insertion (14.38%), 52 cases with marginal PP (35.62%) and 25 cases (17.12%) with lateral PP.

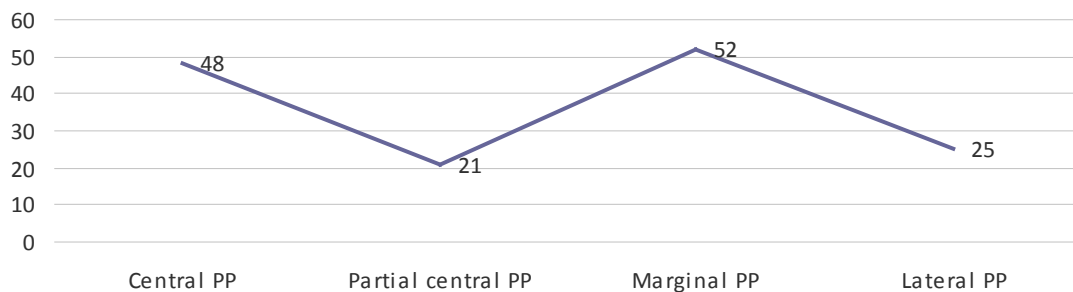


Fig. 5. *Distribution of patients with placenta praevia regarding the anatomical variety of the placental insertion*

The presence of the placenta at the lower pole of the egg decreases the upper strait space and the normal presentation is modifying its axis orientation. This is a determinant factor for the presence of the dystocic presentations. Of the 146 patients with praevia insertion, the presentation of the fetus at the moment of birth was cranial in 114 cases (78.08%), transversal in 15 cases (10.27%) and breech presentation in 17 cases (11.64%). The rate of dystocic presentations was 21.90%.

The treatment applied to pregnant women with praevia insertion of the placenta in the moment of admission was

different depending on the age of pregnancy, on the mother and fetus status and on symptomatology. In 87 of the cases it was applied medical treatment (81.31%), 6 women had a spontaneous vaginal route birth (5.61%) and 14 of them underwent emergency C- section for fetal distress or cataclysmic hemorrhage (13.08%). The medical treatment applied was antispasmodic, sedative, antalgic, corticosteroids and sympathomimetics. The result was the prolongation of 77.01% of pregnancies, while the rest of 22.99% had a premature birth (Figure 6).

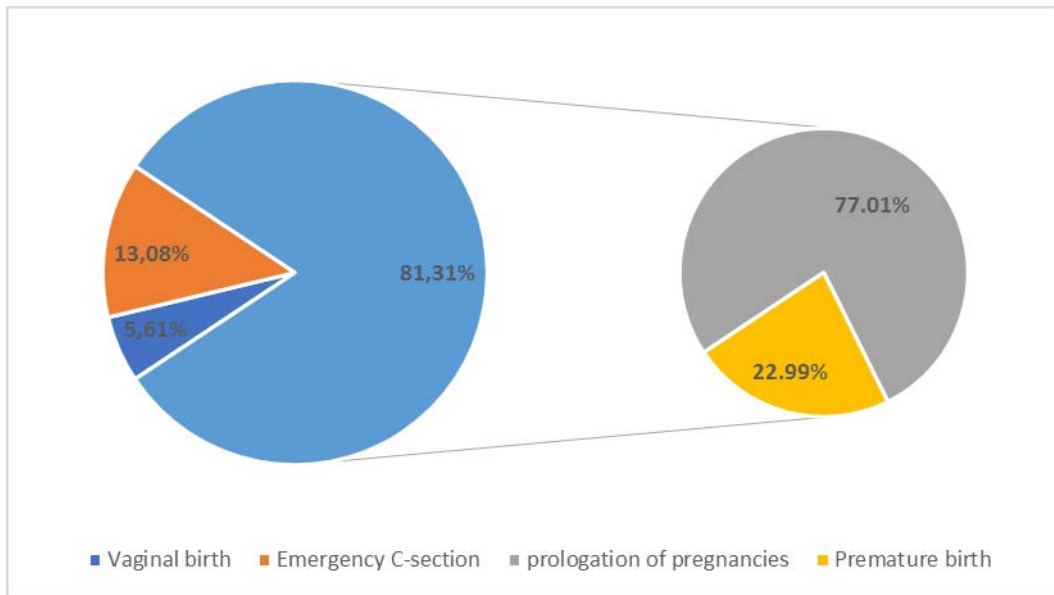


Fig. 6. *Distribution of the pregnancies with placenta praevia depending on the treatment applied*

Of the 146 cases studied, there were 20 cases of premature birth. According to the degree of prematurity we noticed 9 cases of prematurity grade I, 6 cases of prematurity of grade II and 5 cases of prematurity grade III.

Compared to a term birth, the infant mortality rate in cases of prematurity is 12 times higher if the newborn weighs less than 2,500g. Low blood intake and repeated hemorrhage can affect oxygenation and fetal growth.

Regarding the way of delivery in the cases of patients that received medical treatment, 65.07% delivered via C-section and for 34.93% it was possible vaginal delivery but only for those with a lateral or marginal placental anatomy. For 50.53% of those who required cesarean surgery, it has been intervened outside of labor; in 30.53% of the cases the C-section occurred at the onset of labor and in 18.95% of the cases in labor.

The APGAR score less than 7 reflects fetal distress and among the 146

pregnancies studied, 3 newborns had low APGAR scores (A = 5-6), 20 newborns had APGAR score between 7-8 and 123 had a very good APGAR score (A = 9-10) at 5 minutes after birth. The high incidence of newborns with an APGAR score of 9-10 (84.25%) can be noticed, which confirms that despite the pathology of praevia insertion, pregnancies had a favorable evolution.

5. Discussions

In a systematic review which investigated the prevalence of PP as well as the association with the main risk factors, the authors concluded that the overall prevalence rate of PP was 0.4%. This prevalence rate was higher for cohort studies from USA (0.46%) compared with 0.37% obtained from other countries [8]. In the Clinical Obstetrics and Gynecology Hospital Brasov, there were 16,748 births between 2013-2016. 146 patients presented placenta praevia, which corresponds to

0.87%. This percentage falls within the general data on the PP incidence.

Placenta praevia is more common in older women. The reason is not clear, but can be associated with the aging of uterine vascularization, causing hypertrophy. Delaying the first pregnancy after the age of 30 increases the risk of placenta praevia. Following a study in the Mymensingh Nuclear Medicine and Ultrasound Center, over a 2-year period of time (2001-2002), on a cohort of 2,536 pregnant women, the highest incidence of praevia insertion was noticed in pregnant women aged between 28 and 30 years [15]. An increased incidence of placenta praevia in pregnant women over 30 years old was also obtained from a retrospective study of all cases of PP administered at University Hospital in Ilorin, Nigeria for 5 years (2011-2015). Of a total of 164 pregnancies with this complication, 110 (67%) of women were over 30[24]. Another study on Norwegian women, it was thought that postponing birth over 34 years old increases the incidence of PP and that the association between pregnancy and a personal history of PP had a 10-fold greater risk of PP at the next pregnancy [25]. In our study group, the group age of the cases that presented with placenta praevia was represented by the women between 15-41 years and we noticed a frequency of 39.73% of the PP between 30-34 years, corresponding to the maximum fertility period of the woman, which is in accordance with the literature.

It is claimed in the literature that PP occurs in 1 of 1,500 primiparous and in women with 5 or more previous pregnancies [19]. Following a study in Sudan and South Asia conducted on a study group of 400 pregnant women, of whom 125 had praevia insertion of the

placenta, the authors concluded that 19.75% of cases with PP were primiparous and the remaining 80.25% of cases were multiparous [1]. Another study realized by the Department of Obstetrics and Gynecology at the "Saidu Sharif Swat" Hospital, Pakistan, between 2006-2007, included 5,267 women, of whom 226 were diagnosed with PP. As a result, 22 of them were primiparous, 79 were at the second or third birth and the remaining 125 had over 4 previous births. This is the proof that multiparity is a predisposing factor to abnormal insertion of the placenta [13].

Studies showed that PP complications are associated with the birth of male fetuses. The reason for this is unknown but it could be related to maternal hormones or to prematurity. *Jakobovits et al.* concluded in a study which included 144 cases of PP, that there was a predominance of male in pregnancies with this pathology [17]. The premature rupture of the membranes also occurs more frequently in pregnant women with male fetuses. *D'Souza D.* et al performed a retrospective study over a 4-years period of time that included pregnancies with PP registered at the Birmingham Women's Hospital Trust. The conclusion was that the male fetuses had higher weight in the placenta praevia group compared to the control group [10]. In our study we can see a difference of 18.52% between the two genes, male gender being predominant.

Smoking during pregnancy is associated with placenta praevia, abruptio placentae, preterm rupture of membranes, premature birth, intrauterine growth restriction and sudden death syndrome in infants. Approximately 15-20% of women are smoking during pregnancy and smoking is responsible for 15% of premature births, low birth weight (20% of cases) and an

increase with 150% of global perinatal mortality [27]. Smoking increases the risk of PP through a hypoxic mechanism. Nicotine has a vasoconstrictor effect on utero-placental vascularization and the consequence is the attempt of the placenta to cover the vascular deficiency by increasing the surface [27]. *Ananth et al.* conducted an epidemiological study on 87,148 pregnancies to illustrate the role of cigarette smoking as a risk factor for PP. The results showed a poor association between smoking and PP, but this is a solid risk factor in the take-off of placenta and other uterine bleeding [2].

The risk of placenta praevia can be increased by medical assisted reproduction techniques. It is not known if the increased risk is because of the factors related to the reproduction technology or is associated with maternal factors, but a relatively low incidence of PP pregnancies results from special fertilization techniques (4.11%) compared to naturally obtained pregnancies. A nationwide population study which included 845,384 pregnancies reported in the Norwegian Birth Registry between 1988-2002, compared the risk of PP at 7,568 pregnancies obtained after assisted fertilization. This study revealed a 6-fold greater risk of PP in pregnancies obtained after assisted fertilization [25].

Usta et al. conducted a study in 2005 to identify the risk factors and complications of PP accreta. Of the 347 cases, 22 were PP accreta and 325 with PP [32]. Bowman et al. also investigated the risk factors for placenta accreta [4]. Previous history of C-section, hypertension, multiparity, smoking and abortions history were the main risk factors [32]. Abortion is also a significant factor that predisposes to abnormal insertion of placenta. Within the studied group, 38% of pregnant women had at

least one previous abortion compared to the remaining 62% without history of abortion. The highest number of abortions was 7 in a 35-year-old pregnant woman. History of abortions predispose to PP because it is considered that abortions cause defective vascularization due to consecutive inflammatory or atrophic changes. It represents one of the etiological factors in 33% of placenta praevia; also, manual extraction of the placenta is an etiological factor in 8% of cases and C-section in 10% of cases.

In the Department of Obstetrics and Gynecology of Saidu Sharif Swat Hospital in Pakistan, it was realized a study that included 5,267 women, of whom 226 were diagnosed with PP. Two of these were at the first C-section and 224 had more than one cesarean in their personal history. The study concluded that a history of C-section is an important risk factor for the praevia insertion of the placenta [13]. Usta et al. considered that the risk of developing PP increases with the number of cesareans in the past: 1.9%, 15.6%, 23.5%, 29.4%, 33.3% and 50.0% after 0, 1, 2, 3, 4 and 5 previous C-section [32].

Cibu O.A. et al. in a study of 53 patients in Obstetrics and Gynecology Hospital, Iasi, achieved a 62.26% incidence of PP in women with obstetrical pathological antecedents [5]. In our study, we noticed a very high percentage of PP on scarring tissue (71.43%) compared to the patients without a previous C-section (28.57%).

Several authors suggest that PP has a higher risk of intrauterine growth restriction which is a significant risk factor for perinatal mortality. Low blood supply and repeated bleeding may affect oxygenation and fetal growth [14], [31].

In the case of patients with abnormal insertion of the placenta, vaginal delivery

is only possible for those with a lateral or marginal placental insertion. Vaginal delivery is preferable to occur if the distance between the placenta edge and the internal cervical of exceeds 20 mm [31]. In the studied group, an increased number of cesarean interventions can be noticed: 95 of them had a C- section and for 51 of the cases vaginal delivery was possible (34.93%). Another retrospective study was based on 264 pregnant women who completed their pregnancy by C-section. 88 of them had PP and required cesarean surgery while the remaining 176 required cesarean surgery because of other complications than placenta praevia. Various authors suggests that only 10% of patients with PP show significant metrorrhagia that requires immediate treatment while in 18% of cases bleeding episodes are at high intervals and with low abundance, allowing for strict supervision until the viability period is reached or even until term [16], [29].

Walker MG et al. has conducted a prospective study that included 33 pregnant women with PP and abnormal adherence of placenta at Mount Sinai Hospital, Toronto. The result of the study demonstrated that 22 of 33 cases required multidisciplinary care [34]. Another resource used in PP management is illustrated by *Ji W. et al.* who investigated a cohort of 45 women with PP and resorted to uterine artery embolization (UAE) to treat postpartum hemorrhage. The location of the uterine and placental artery was determined by selective and supraseductive catheterization in the internal iliac artery. The selected arteries were embolized by inserting several lumps of gelatin sponge into the lumen. UAE proved to be effective in 100% of cases [18].

In the period between 2011 -2013, *Uygur D. et al.* has studied on a cohort of 237 pregnant women with PP the effectiveness of intrauterine hemostatic tamponment with BT-Cath. It has been used in 53 patients. Effective hemostasis was achieved in 85% of cases and 11% of cases required hysterectomy of necessity. The duration of intrauterine tamponment was about 9.8 hours and the efficiency was high [21], [33].

Regarding the hysterectomy of necessity, frequently used in case of abnormal adherence of the placenta, depending of the depth of invasion, a study from 2016 on 13,162 patients pointed out that in 25% cases of invasive insertion of placenta it was preferred this management [3].

6. Conclusions

Placenta praevia is an obstetrical pathology with serious consequences on both the mother and fetus if it is not properly managed. Placenta praevia has a low incidence and the onset symptom is hemorrhage.

Fetal prognosis in pregnancies with placenta praevia is mainly influenced by the added risk of prematurity and intrauterine growth restriction and the goal of the treatment is to achieve a maximum of fetal maturity with minimal risks for both the mother and the fetus. This study highlights the need for a rapid diagnosis, for proper follow up and for correct management of pregnancies with this.

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