



## Extreme morbidity in pregnant adolescents: Case series and review of literature

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### Abstract

**Background:** In Mexico, between the years of 2014 to 2017, adolescent pregnancies corresponded to 19.2, 18.2 and 17.9%, respectively. Approximately 15,000 women die each year in Latin America and the Caribbean due to pregnancy related causes.

**Objective:** To describe a case series of pregnant adolescents that required intensive care at Instituto Nacional de Perinatología.

**Methodology:** Retrospective case series of pregnant adolescents that had a life-threatening condition, and that were attended at Instituto Nacional de Perinatología between January of 2015 and December of 2018.

**Results:** A total of 122 adolescents were included. Mean age was 16.9 +/- 1.5 years. Most frequent associated pathologies were: cardiopathy (n=22), nephropathy (n=13), and diabetes mellitus (n=5). Obstetric morbidity was mostly due to hypertensive disorders of pregnancy (n=65): preeclampsia in 59 patients, and eclampsia in 6 patients. Cesarean delivery was required in 60% of deliveries. Regarding contraception, 38% didn't have a contraceptive method.

**Conclusions:** Pregnancy repercussion during adolescence is considered a global health issue, and the adolescent mother needs to understand the consequences associated with this, as well as potential risk factors, such as: low scholary, early sexual activity onset, partner absence, maternal history of adolescent pregnancy, and lack of knowledge and access to contraceptive methods.

**Keywords:** adolescent, pregnancy, extreme, morbidity

### Introduction

Fifteen years ago, around 16 million women between 15 and 19 years, and about a million underage girls (under 15 years), gave birth each year, mostly in poor and underdeveloped countries [1]. Nowadays, pregnancy among adolescents continues to be more prevalent in poor and developing countries, and correspond to about 11% of all births around the world [2].

In Mexico, between the years of 2014 to 2017, adolescent pregnancies corresponded to 19.2, 18.2 and 17.9%, respectively [3]. die each year in Latin America and the Caribbean due to pregnancy related causes [4]. Adolescents between 15 and 19 years old have twice the odds of dying during pregnancy or birth than dose older than 20 years, and those under 15 years old have 5 more times that risk (5). It is estimated that 10 million pregnant women around the world experience an extreme morbidity complication each year that puts their life at risk [6]. According to the World Health Organization (WHO), a woman that experiences a life-threatening situation, and survives pregnancy, birth and puerperium, correspond to a case of extreme morbidity or maternal "near-miss" [7].

It is estimated that for each case of maternal death there are approximately 15 cases of "near-miss" [8]. A situation that is potentially life threatening can be secondary to a broad category of clinical conditions, including pathologies during pregnancy, birth and puerperium. In order to be included in this definition,

women most fulfill certain criteria, including clinical parameters, laboratories, clinical conditions (e.g. preeclampsia and hemorrhage), and interventions (e.g. suture tears, laparotomy, transfusion and intensive care unit admission) [9].

### Methodology

Retrospective case series of pregnant adolescents that had a life-threatening condition, and that were attended at Instituto Nacional de Perinatología between January of 2015 and December of 2018. The sole inclusion criteria was intensive care unit (ICU) admission.

### Results

Patients seen from January 2015 to December 2018 were included. During that timeframe, 1175 births occurred, of which 4.7% were from adolescent mothers. The study group was comprised by 122 pregnant adolescents. Mean age of the included patients was 16.9 +/- 1.5 years. By marital status, 60 were single, 58 lived in free union, and 4 were married. Regarding parity, 110 were primigravid. Most frequent associated pathologies were: cardiopathy (n=22), nephropathy (n=13), and diabetes mellitus (n=5). Obstetric morbidity was mostly due to hypertensive disorders of pregnancy (n=65): preeclampsia in 59 patients, and eclampsia in 6 patients. With

less frequency, we found other comorbidities such as chronic systemic arterial hypertension, systemic erythematous lupus and epilepsy. Obstetric morbidity was mostly due to hypertensive disorders of pregnancy (n=65): preeclampsia in 59 patients, and eclampsia in 6 patients. Other less common encountered obstetric comorbidities were intraamniotic infection, intrahepatic cholestasis of pregnancy, and placental abruption. Regarding the procedures and interventions, 12 patients required blood transfusions, 5 required vaginal tear sutures, and 4 were candidate to exploratory laparotomy. Cesarean delivery was required in 60% of deliveries. Regarding contraception, 38% didn't have a contraceptive method. In terms of contraception, 38% didn't have a contraceptive method.

**Table 1:** general characteristics of the patients

Age (n)	Associated pathologies (n)	Obstetric morbidity (n)
13 (3)	Cardiopathy (22)	Preeclampsia (59)
14 (6)	Nephropaty (13)	Eclampsia (6)
15 (15)	Diabetes mellitus (5)	Intra-amniotic infection (5)
16 (21)	Arterial hypertension (2)	Intrahepatic cholestasis of pregnancy (2)
17 (29)	Erythematous systemic lupus (2)	Abruptio placentae (1)
18 (24)	Epilepsy (2)	Acute fatty liver (1)
19 (24)	Tuberculosis (2)	Previous placenta (1)

**Table 2:** Contraception

Method	Number of patients
Intrauterine device	46
Bilateral tubal occlusion	20
Subdermic implant	11
Oral hormonal	1

## Discussion

In the year of 2009, WHO published a list of maternal conditions that can potentially put a patient's life at risk, which included 4 groups: hemorrhagic complications (placenta accrete, uterine rupture, uterine atony, and perineal lacerations), hypertensive disorders, severity management indicators (transfusion, ICU admission, surgical reintervention, and major surgery such as laparotomy and hysterectomy), and others (pulmonary edema, sepsis, thrombocytopenia, cardiopathy, acidosis, coagulation disorders, hepatic dysfunction and renal impairment) [7].

Of the already published series of adolescent pregnancies with extreme morbidity, a few are worth mentioning. The first was realized in 8 Latin American countries, and it included 97,095 births, in which "near-miss" patients of 10 to 19 years old represented 2.9% of all births [11]. Another one of these was realized in Argentina, and it included a total of 522 women with severe comorbidity, of which 16.1% were 20 years old [12]. Furthermore, in a Brazilian population of nearly 20 million pregnant women, 17.9% were adolescents between 15 to 19 years old, and 1.5% presented extreme morbidity [13]. In one of the latest series we encountered, of a total of 82,144 births, 17.9% were adolescents, of which 17% of those between 15 to 19 years and 1.2% of those between 10 to 14 years old presented with life threatening events [14].

In a systematic review about complications in pregnant adolescents that included a population of over 150,000 women, it

was found that 10% of them presented hypertensive disorders, and 0.7% presented with hemorrhage [15]. In more recent years, it has been found that the most frequently encountered diagnostic criteria of severe maternal morbidity include preeclampsia and ICU admission as risk factors for progression to death [16]. The American College of Obstetrics and Gynecology (ACOG), and the Society for Maternal-Fetal Medicine recommend using 2 criteria for the inclusion of cases with extreme maternal morbidity: transfusion of 4 or more units of blood, and ICU admission [17]. Additionally, these groups present a list of conditions that represent severe maternal morbidity, such as: hemorrhage (transfusion of 4 or more units of red blood cells, combination of 2 platelet and 2 fresh frozen plasma units, surgical reintervention, peripartum hysterectomy, or need for intrauterine balloon tamponade), hypertension (eclampsia, coma, preeclampsia lasting longer than 48 hours, transaminases >600 UI, or HELLP syndrome), renal (tubular necrosis, oliguria requiring multiple doses of diuretic, or creatinine >2 mg/dL), sepsis with hypotension, pulmonary (mechanical ventilation, or pulmonary embolism), cardiac (preexisting cardiopathy or arrhythmia), intensive care, intestine or bladder injury, ileum lasting >4 days, and anesthetic complications [17].

Hypertensive disorders of pregnancy are among the most common causes of maternal morbidity, hospitalization due to clinical complications, and both maternal and fetal prognosis deterioration [18]. It is estimated that hypertension complicates around 5-10% of all pregnancies. According to the WHO, hypertensive disorders are the most common cause of maternal death in Latin America [19]. Patients with eclampsia have a mortality risk of 8%; they tend to be younger, and primigravids have 16 times the risk of those with chronic hypertension and nearly 50 times more when compared with those that have preeclampsia [20].

Severe morbidity associated with postpartum hemorrhage includes anemia, disseminated intravascular coagulation, transfusion, hysterectomy, kidney and liver injury [21]. Only one third of all postpartum hemorrhage cases have an identified risk factor, such as: previous hemorrhage, nulliparity, uterine overdistension, placental abnormalities, coagulation disorders, anemia, induction of labor, prolonged labor, and need for epidural blockade [22]. Uterine atony is the most common cause of postpartum hemorrhage [23]. The prophylactic administration of an uterotonic agent has been shown to reduce the incidence of postpartum hemorrhage, and oxytocin is the agent of choice [24]. In a review of 274,985 women from 28 countries, postpartum hemorrhage in women younger than 20 years occurred in 10% of the time. In the subpopulation of women from Latin America and the Caribbean, hemorrhage occurred in 18% of cases. A third of those cases required blood transfusions, and 17% were considered to have severe obstetric morbidity [25]. The different mortality rates between high and low-income countries resides in the management given to life-threatening complications. Providing a timely management to obstetric emergencies is key in reducing maternal morbi-mortality [26].

A while ago, the three delays model for evaluating access to proper obstetric emergency care was developed. Phase 1 is the delay in deciding to look for attention. Phase 2 is the delay in reaching a proper health care center. Finally, phase 3 is the delay in getting a proper management [27]. In a period of 12 months,

where 9,555 morbi-mortality cases were evaluated, 53% of cases presented some delay, the most frequent (34%) been access to health services and patient's characteristics.

Not much work has been done about the long-term repercussions after extreme maternal morbidity events. Much less information is available regarding the reproductive health of these women. In a review of 655 women who were admitted to the ICU, 6.5% were younger than 19 years, and hysterectomy or tubal occlusion was performed in 27%. In the follow up of 382 cases, only 7.5% of cases presented a subsequent pregnancy. In that same study, the risk of developing any kind of complication was five times higher among women that had an extreme morbidity event. The loss of reproductive capability represents a negative emotional factor associated with health<sup>[28]</sup>.

### Conclusions

Pregnancy repercussion during adolescence is considered a global health issue, and the adolescent mother needs to understand the consequences associated with this, as well as potential risk factors, such as: low scholarity, early sexual activity onset, partner absence, maternal history of adolescent pregnancy, and lack of knowledge and access to contraceptive methods.

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