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## Pre-Anesthetic Consultation, Stress and Preoperative Anxiety in Risk Pregnant Women

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### Abstract

**Aim:** Gestational risks and elective interruption of pregnancy may result in stress and hospital anxiety. The objective of this study was to investigate associations between stress, hospital anxiety, and clinical outcomes, such as metabolic, obstetric, neonatal and puerperal results.

**Study design:** A cohort of 42 risk pregnant women who were indicated for an elective interruption of pregnancy was investigated using the Lipp's Stress Symptoms Inventory for Adults (LSSI), to evaluate stress symptoms at 35th gestational week and puerperium period; and the Hospital Anxiety and Depression Scale (HADS), to evaluate hospital anxiety at the delivery moment. All were attended in a pre-anesthetic consultation during pregnancy. The participants were recruited during 17 months at the Maternity School Hospital of Universidade Federal do Rio de Janeiro. This is a public hospital that receives patients on demand.

**Results:** It was observed that 48.9% of patients presented stress symptoms in their 3rd trimester of pregnancy, but this rate decreased at the puerperium, when 73.8% of them were not stressed. Significant differences were found between prenatal and puerperium stress level ( $p>0.05$ ). Also, 11.9% of participants presented clinical levels of hospital anxiety by the HADS applied at delivery moment.

**Conclusion:** Our findings suggest that the stress level of participants was mostly related to the risk pregnancy condition and decreased after delivery. Future research must investigate the effect of pre-anesthetic consultation in hospital anxiety and its relations with gestational and post-partum outcomes.

**Keywords:** Pregnancy; Anxiety; Stress; Pre-anesthetic consultation

### Introduction

Risk pregnancy may lead to a vulnerability condition due to physical, social and psychological changes on woman's life, and it can also result in adverse outcomes. Elective interruption of pregnancy may be an obstetric procedure to prevent and minimize potential negative obstetric outcomes. Nevertheless, this procedure can result in elevated levels of stress and anxiety, especially in the last trimester of gestation, when mother's expectations and anxiety may increase due to the proximity of baby arrival and the delivery [1,2].

Stress is a pattern of responses with physical and psychological components when the equilibrium between the organism and environment is disturbed [3-5]. According to the General Adaptation Syndrome (GAS) model, stress can be studied as a process with stages: alarm, resistance and exhaustion [4]. In the stage of alarm, the adrenaline increases, resulting on energy and vigor that prepare individuals to deal with a critical situation. The second stage of stress is the resistance stage, when stressor agents persist, and the organism tries to resist and cope with stress. In this stage, individuals can present memory deficits, and physical and mental fatigue. The exhaustion is the most negative stage of stress and can result in significant imbalance that affects the overall health and quality of life. According to Lipp [4], there is also an intermediate stage of stress, the near-exhaustion stage, characterized by a libido decrease, cognitive deficits, apathy, and self-doubt beliefs. It is estimated that 25% of women present some type of stress during pregnancy [3,6]. Different studies suggest that there are associations between prenatal stress and negative clinical outcomes, such as postpartum depression, premature birth, low birth weight, and cognitive impairments on children [7-10].

Pregnant women with indication for elective delivery can show anxiety symptoms, such as tension, worries, difficulty in relaxing, and even panic attacks. Hospital anxiety is a type of anxiety presented in the hospital setting, especially face to clinic, surgical or anesthetic procedures [11,12]. The hospital anxiety may be higher when the patient does not have clear knowledge and proper information about procedures [11]. High levels of hospital anxiety can have negative impact on pregnant women, who may not experience the pregnancy and birth as positive events, with repercussions throughout postoperative and puerperium periods [7,11-13]. Literature highlights that the pre-anesthetic consultation can support pregnant women to deal with the hospital anxiety and stress symptoms offering individualized assistance based on information about surgical procedures [13-15].

The pre-anesthetic consultation in the 3rd trimester of pregnancy has been adopted as a routine assistance in the Maternity School Hospital of Universidade Federal do Rio de Janeiro since 2014. This consultation is part of the Prenatal care multi professional service of this maternity and follows the policy of Federal Medical Council of Brazil, which states that the pre-anesthetic consultation should promote a good relationship between physician and patient, as well as provide information about anesthetic options and their risks and advantages. Based on this, the pre-anesthetic consultation may also be an opportunity to establish a rapport between patient and health professional in order to prevent hospital anxiety. Considering that elevated levels of anxiety and stress in pregnancy are related to negative obstetric outcomes [6-10], it is important to identify hospital anxiety and stress in the pregnancy, especially in women facing an elective interruption of pregnancy. There are few studies about hospital anxiety and its relations with prenatal stress and gestational and post-partum outcomes in this specific population in Brazil. The objective of this study was to identify stress and hospital anxiety in pregnant women indicated for an elective interruption of pregnancy and attended in a pre-anesthetic consultation, and discuss associations between stress and hospital anxiety, and metabolic, obstetric, neonatal and puerperal outcomes.

## Methods

The study followed the guidelines of Ethical Committee for Research with Human Beings [16] and was approved by the Ethical Committee of the institution (CAAE 29114914.3.0000.5275). It is a prospective cohort study based on a descriptive quantitative design conducted during 17 months with a sample of 42 women at 35th week of gestation with indication of elective interruption of pregnancy. All pregnant women were attended at the pre-anesthetic consultation from the prenatal care service of the Maternity School Hospital of Universidade Federal do Rio de Janeiro. This is a tertiary maternity hospital that attends patient on demand, specialized on risk pregnancy.

The study sample included pregnant women with single pregnancy, normal results for maternal, fetal, clinical and laboratory tests (fasting glucose  $\geq$  95 mg/dl; postprandial

glucose  $\leq$  140 mg/dl; cardiotocography with good vitality and obstetric ultrasound with normal fetal weight and liquid volume), and minimum levels of anxiety according to the Beck Anxiety Inventory - BAI [17]. All participants were indicated for elective delivery according to the following clinical criteria: term pregnancy with mild or moderate hypertension (diastolic and systolic blood pressures:  $<110$  and  $160$  mm Hg, respectively); controlled diabetes mellitus; previous cesarean section, and fetal breech presentation. Patients in use of anxiolytic, sedative, or psychoactive drugs, and with severe psychiatric illness, previous surgical complication, corticotherapy, and ongoing labor were excluded from the study.

The pre-anesthetic consultation followed an institutional protocol, which is based on the policy of Resolution 1802/2006 of the Federal Medical Council of Brazil. In this consultation, a clinical evaluation is performed, and an intervention strategy is planned for each pregnant woman to prepare her for the perioperative period. Also, patients are informed about the anesthetic options and their consent for anesthesia is required in an informed consent form.

Before the data collection, all participants signed the Free and Informed Consent Form approved by the Ethical Committee of institution. All participants were evaluated by a psychology professional to identify psychological symptoms of stress and hospital anxiety during the pre-anesthetic consultation conducted by the anesthesiologist.

The Lipp's Stress Symptoms Inventory for Adults (LSSI) [3] was used to evaluate prenatal stress at 35th week of gestation, and during the pre-anesthetic consultation. Stress was also evaluated using LSSI at puerperium medical appointment occurred around one month after childbirth. The LSSI is a Brazilian normative scale to evaluate signs and symptoms of stress with good psychometric properties (Cronbach's alpha, 0.91) validated on a study with 1853 people from 15 to 75 years old [3,18]. It classifies the stress into four stages (alarm, resistance, almost-exhaustion, and exhaustion) based on the identification of physical, psychological and mixed symptoms that are typical of each stage of stress.

The hospital anxiety was evaluated at the delivery moment using the Brazilian version of Hospital Anxiety and Depression Scale-HADS [11]. The HADS is a Likert scale with 14 items, and two subscales (7 items for anxiety and 7 items for depression). Each scale item can be scored from 0 to 3, with a maximum score of 21 points for each subscale. Original study of HADS recommends a cut-off point of  $\geq 9$  scores for classification of anxiety or depression, for both subscales [12]. The same classification was recommended for Brazilian version [11]. The HADS has been used in different studies that investigate preoperative hospital anxiety, including researches with pregnant women [2,19].

Socio-demographic and psychological data were collected from medical patient reports and in individual interviews. Data on metabolic (fasting blood glucose level), obstetric (delivery route), and neonatal (Apgar scores and birth weight) outcomes were collected from medical patient records. All data were

processed and analyzed using the SPSS (Statistical Package for Social Sciences) version 17.0 (SPSS Inc., Chicago, IL, USA). Socio-demographic and psychosocial data were analyzed descriptively in terms of means and standard deviations.

Associations among stress, hospital anxiety, and those outcomes and socio-demographic and psychosocial data were investigated using the Wilcoxon, Chi-Square and Kruskal-Wallis tests, adopting  $p \leq 0.05$  as significance level.

**Table 1** Socio-demographic data of pregnant women (n= 42).

Variables	Range	M $\pm$ SD
Age	17-44	33.4 $\pm$ 6.2
-	n	%
<b>Education</b>		
Elementary School	26	61.9
High School	11	26.2
Higher Education	5	11.9
<b>Marital Status</b>		
Married	38	90.5
Single	4	9.5
<b>Parity</b>		
Primiparous	11	26.2
Multiparous	31	73.8
<b>Working status</b>		
Employed	28	66.6
Unemployed	14	33.4
M=Mean; SD=Standard Deviation		

## Results

Socio-demographic data are summarized in **Table 1**. The mean age of pregnant women ranged from 17 to 44 years (M = 33.7; SD = 6.2).

Regarding education level, 26 (61.9%) women had Elementary school, 11 (26.2%) had High School, and 5 (11.9%) had Higher education levels. Related to the marital status, the

majority of women (90.5%) were married, and multiparous (73.8%). More than half of sample were employed (66.6%).

Data from metabolic, obstetric, neonatal and puerperal outcomes are summarized in **Table 2**. The majority of sample was diagnosed with Gestational Diabetes Mellitus (GDM) (88%). Also, eight women were mild or moderate hypertension (diastolic and systolic blood pressures: <110 and 160 mm Hg, respectively) and two were obese.

**Table 2** Metabolic, obstetric, neonatal and puerperal outcomes of pregnant women.

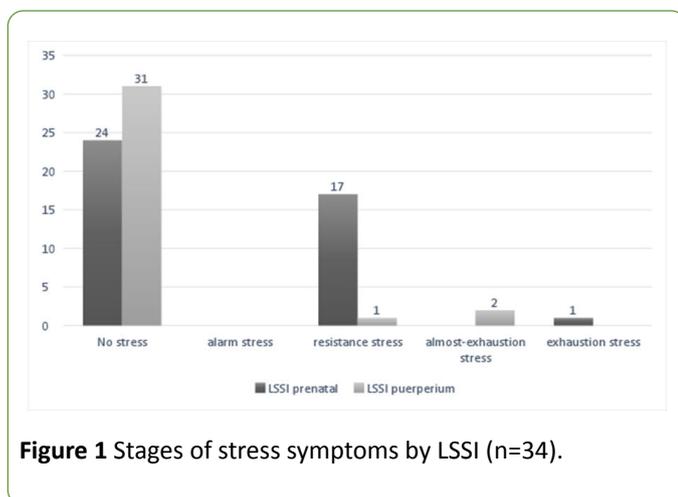
Outcomes	n	Range	M $\pm$ SD	
<b>Metabolic</b>				
Blood Glucose	Pre-consult.	39	-	92.9 $\pm$ 14.3
	Post-consult.	30	-	95.8 $\pm$ 22.7
<b>Obstetric</b>				
Birth route	Vaginal delivery	11	-	26.2
	Cesarean	28	-	66.4
<b>Neonatal</b>				
Apgar scores	1st minute	39	4-9	8.4 $\pm$ 0.96
	5th minute	39	8-10	8.9 $\pm$ 0.49

Birth weight (gr)	39	2545-4110	3265 ± 396
M=mean; SD=Standard Deviation;			

From the sample, 3 pregnant women were not evaluated for hospital anxiety and obstetric (delivery route) and neonatal (Apgar scores and birth weight) outcomes were not obtained because their delivery not occur in our maternity. The more frequent type of delivery route for 39 participants was elective cesarean section (66.7%). The range of Apgar scores was 4-9 ( $8.4 \pm 0.96$ ) at the 1st minute and 8-10 ( $8.9 \pm 0.49$ ) at 5th minute; and the birth weight ranged from 2545 g to 4110 g ( $3264 \pm 396$  g).

The fasting blood glucose levels data were obtained from medical reports for pregnant women because it is a routine according to the prenatal care protocol of our maternity. Statistically significant differences were not found between fasting blood glucose levels before and after the pre-anesthetic consultation ( $p > 0.05$ ;  $r = 0.63$ ).

Prenatal stress data (e.g. stress levels evaluated at 35th week of gestation and at the pre-anesthetic consultation) can be observed in **Figure 1**. It was observed that 48.9% (n=18) of pregnant women showed stress symptoms during prenatal period. Among those, the majority showed symptoms of resistance stress (94.4%). At the puerperium, stress was not assessed in 8 women because they did not attend the puerperium medical appointment. For 34 women reevaluated for stress, 31 (73.8%) did not present stress.



**Figure 1** Stages of stress symptoms by LSSI (n=34).

Statistically significant differences were found between prenatal stress (at pre-anesthetic consultation) and puerperium stress (at medical appointment) levels ( $p > 0.05$ ).

Related to hospital anxiety, 37 pregnant women (88.1%) did not show symptoms of anxiety with scores  $\geq 9$  by the Hospital Anxiety and Depression Scale (HADS). Statistically significant associations among stress, hospital anxiety and socio-demographic and psychosocial data and those outcomes were not found.

## Discussion

Considering the pre-anesthetic consultation as an important moment to manage a rapport with women facing an elective interruption of pregnancy, the main objective of this study was to identify stress and hospital anxiety in pregnant women indicated for an elective interruption of pregnancy and attended in a pre-anesthetic consultation, and discuss associations among prenatal stress, hospital anxiety, and metabolic, obstetric, neonatal and puerperal outcomes. It was observed that less than half (48.9%) showed stress symptoms at the pre-anesthetic consultation assessment. In addition, most of them did not present significant levels of hospital anxiety at the elective delivery moment (after pre-anesthetic consultation). These data may be related to the quality of the routine service of the maternity, in which the prenatal care has been conducted by a multi professional team. This care can promote adaptive strategies for woman to cope with their pregnancy demands. The prenatal assistance, that included a pre-anesthetic consultation, was centered on individual needs, and can result on the development of positive coping strategies. This hypothesis must be analyzed in future studies, considering that coping process is a multi and complex phenomenon that should be investigated on a multi-methodological design using different measures, like coping scales combined with interviews, for example.

Also, 11.9% of patients showed symptoms of hospital anxiety evaluated at the delivery moment. It is important to highlight that the pre-anesthetic consultation in our maternity is mandatory to provide information about anesthetic options, its risks and advantages for all pregnant women with indication for elective delivery. According to the literature, it can be a helpful strategy to identify and support patients to manage stress and hospital anxiety at the preoperative period [13-15,20], and modify their beliefs related to anesthesia. These beliefs usually are associated with feelings of fear and insecurity about anesthetic procedures and elective delivery. Frequently the contact between the anesthesiologist and patient occurs only at the day of surgical event, and the pre-anesthetic consultation can be efficient to provide information about surgical procedures before the elective delivery to support the women cope with stress and hospital anxiety. Studies confirmed that an adequate information prior to surgery can reduce the perception of pain at post-surgical period [13-15]. So, the informative communication by anesthesiologist can minimize an excessive anxiety and concerns related to surgical procedures and pre and postoperative periods. Moreover, the pre-anesthetic consultation can help pregnant woman to experience the period before and during the delivery in a positive way. Nevertheless, we cannot draw large conclusions about the role of pre-anesthetic consultation to reduce hospital anxiety or its effect on puerperium outcomes. We suggest future studies

with control groups to provide further data about the pre-anesthetic consultation as a potential intervention to manage hospital anxiety of patients with indication of elective delivery.

Significant differences ( $p>0.05$ ) were found between stress levels from prenatal (at pre-anesthetic consultation) and puerperium (at medical appointment). This finding can suggest that the stress experienced was closely related to the condition of risk gestation and/or to typical demands of pregnancy period. The identification and evaluation of stress symptoms during the puerperal and pregnancy periods is commonly neglected in perinatal health care in Brazil. However, literature highlights the relationship between maternal mental health and negative outcomes in gestation [7-13]. Thus, it is important that prenatal assistance also addresses women's mental health. A multi professional team can assume an important role in prenatal assistance promoting women mental health and preventing negative outcomes for the baby. Even though it is expected that stress levels can be relieved after delivery for pregnant women who need elective interruption due gestational risks, the reduction of stress in the puerperium can be considered a positive outcome related to the institutional protocol that include the pre-anesthetic consultation.

Despite no significant correlations were found among stress, hospital anxiety and socio-demographic and psychosocial data, the literature confirm that women expectations about her pregnancy, and social and psychological changes in her personal and familiar routine can increase prenatal stress [10,21,22] especially on risk pregnancy. In these cases, the proximity of labor and an indication of elective delivery may also result in hospital anxiety. Schetter and Tanner affirm that some stressors, such as few material resources, unfavorable employment conditions, excessive family and domestic responsibilities, tensions in marital relationships, and pregnancy complications, can affect all pregnant women [23]. However, considering that the majority of our sample was married (90.5%) and had children (73.8%), the partner and family can be also a source of social and emotional support in pregnancy [22]. These findings can be related to 51.1% of patients not stressed at pre-anesthetic consultation. Also, the prenatal stress can be predominantly related to gestational demands, and because of this did not increase in puerperium. Factors, like be married and having children, can help women adopt adaptive strategies to cope with the demands of risk pregnancy, and to manage stress during pregnancy [22,24]. Moreover, 66.6% of pregnant women were employed. The employment, associated with marital status, educational level and prenatal care, is a protective mechanism against prenatal stress [22,24].

On the other hand, almost half of participants (40.5%) showed stress symptoms in the resistance stage. For them, the experience of stress was more intense, and result on a constant attempting to maintain the physical and psychological balance to resist large periods of stress [3]. Likewise, the resistance stress may have related to events before pregnancy, like the demands with other children, for example. The stress in the resistance stage contributes to an increase and

chronification of psychological symptoms, such as tiredness, memory deficits and irritability. Stress should not be neglected in pregnancy due to its repercussions on the woman well-being and baby development, specially the resistance stress [6-10,23].

Considering the relationship between high levels of prenatal stress and negative obstetric outcomes [6-10] our objective was also to investigate associations between stress and obstetric outcomes, in order to discuss how prenatal care service can help to identify stress in pregnancy and its impact on puerperium. Stress results on physiological responses (neural and endocrine) that are related to metabolic, cardiovascular and autonomic nervous system functioning [25]. Associations between stress levels and metabolic outcomes (fasting blood glucose levels before and after the pre-anesthetic consultation) were investigated. Different from the literature [25], no significant correlations were found between stress and metabolic outcomes. Those outcomes can be interpreted as a positive result in our study. The mean values of fasting blood glucose levels before and after the pre-anesthetic consultation (92.8 mg/dl and 95.8 mg/dl, respectively) indicated a good glucose level control, according to the Brazilian prenatal protocol [26].

Neonatal outcomes, such as Apgar scores in the 1st and 5th minutes and birth weight, were also analyzed. Likewise, no significant correlations were found among stress, hospital anxiety and neonatal outcomes. The mean scores of Apgar at 1st minute ( $M=8.4$ ) and 5th minute ( $M=8.9$ ), and the mean of birth weight (3264 g), indicated a good health condition for newborns of those participants. These findings highlight the importance of regular prenatal care for at-risk pregnant women and her concept. According to the Brazilian policies [27], at least six medical appointments are mandatory to guarantee a good prenatal care. A prenatal care service must attend all pregnant women based on a preventive approach for supporting the maternal mental and physical health during and after pregnancy. This approach can prevent postpartum disorders, such as postpartum depression, which may be associated with stress during pregnancy [8,28]. Relations between prenatal stress and postpartum depression may be investigated in order to discuss and confirm the effect prenatal care service in our institution on mental health and other outcomes.

Some limitations of the study should be highlighted. First, the limited sample size and the dropout rate do not allow robust statistical analysis. The second limitation is related to the methodological design of the study: no control group was recruited, and we suggest comparative studies with pregnant women who did not attend on a pre-anesthetic consultation in order to study the role of the pre-anesthetic consultation as an intervention measure to manage hospital anxiety levels. For example, in our maternity, the control group could be recruited among women who are attended at the emergency room but did not attended the long term prenatal care service in the institution. Consequently, we must be careful to draw further conclusions about the benefits of pre-anesthetic consultation on hospital anxiety and stress. Finally, none child

development outcomes were studied. Considering the association between stress and negative outcomes for children's development [7-10], we suggest future studies based on a longitudinal and clinical randomized trial design.

## Conclusion

Literature supports that stress and hospital anxiety are common in pregnant women. [1,2,5,8] and high levels of stress and anxiety are related to negative obstetric outcomes [6-10,19]. Hospital anxiety evaluated at the delivery moment occurred in 11,9% of cases and stress reduced significantly from the pre-anesthetic consultation to puerperal period. However, no associations among stress, hospital anxiety, social-demographic and psychosocial data, and metabolic, obstetric and neonatal outcomes were found. The pre-anesthetic consultation based on a good doctor-patient communication and relationship can be considered as a moment in which it is possible to assess stress and hospital anxiety in risk pregnant women. Further randomized controlled trials must investigate the effect of pre-anesthetic consultation to reduce stress and hospital anxiety in this population.

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