Arch Gynecol Obstet (2015) 291:999–1003
DOI 10.1007/s00404-014-3508-x

MATERNAL-FETAL MEDICINE

Prevalence of anxiety symptoms and depression in the third gestational trimester

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Received: 12 August 2014 / Accepted: 7 October 2014 / Published online: 14 October 2014

Abstract
Objective To determine the prevalence of anxiety and gestational depression and to determine the risk factors associated to its development.
Method Pregnant women during their third quarter of pregnancy were invited to participate to the study, and they signed an informed consent form. After that, they filled in a general assessment questionnaire in which socio-economical and obstetrical characteristics together with general health conditions and behaviors harmful for the pregnancy were evaluated. To determine the anxiety symptoms a STAI A-trait scale and a STAI-A-state scale were used and to measure the depression a CES-D scale was used. A data logistic regression was realized to determine significant associations. The significance level adopted was 0.05 for all statistical tests.
Results The final sample was represented by 207 pregnant women and the prevalence of depression was the highest value (73.5 %), followed by state anxiety (58.5 %) and finally by trait anxiety (53.2 %). Only trait anxiety was explained by the variables studied and it was associated to the realization of a treatment for chronic diseases (OR = 2.93; IC = 1.02–8.41; $p = 0.045$) and the usage of continuous prescription drugs (OR = 2.30; IC = 1.06–4.97; $p = 0.034$).
Conclusions The prevalence of anxiety and depression among pregnant women were both high and only trait anxiety was explained by treatment for chronic diseases and the usage of continuous prescription drugs.

Keywords Gestation · Anxiety · Depression · Risk factors

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Introduction

According to the world health organization, gestation can be defined as a process of intense biological, psychological and social modifications that affect not only the pregnant woman's life, but also the fetus [1].

Several studies have demonstrated the impact and consequences of factors called risk factors for the gestation on the gestational period, on the gestational outcomes and on the health of the newborn [1–5]. These factors considered as risk factors for the gestation include social, psychological and physiological aspects and many of them have already been studied [5]. In this context it is important to underline the importance of psychological aspects like anxiety and depression, which are the ones that least call the attention of the scientific community [2, 5].

The pregnancy experience leads the woman to an exacerbation and this can make her susceptible to several emotional disorders [6]. According to Araujo et al. [1] it can

be estimated that 20 % of women from developing countries like Brazil show an anxiety situation while 7–15 % of them show to be depressed during their gestation. The epidemiological studies are consensual in attributing a relevant importance to the psycho-social aspects on the negative consequences of the gestation, since actually these alterations are not diagnosed and treated correctly [7].

Thus, the objective of the study was to determine the prevalence of anxiety and depression among pregnant women from different municipalities of the South of Minas Gerais state that had a delivery at Casa de Caridade Nossa Senhora do Perpétuo Socorro hospital in Alfenas-MG and to determine the associated risk factors.

Methods

Data collection was realized from December 2011 to March 2013. Pregnant women who had their prenatal treatment in Alfenas-MG and that were going to have their delivery at Santa Casa de Misericordia hospital in Alfenas-MG were invited to participate to the study. The municipality of Alfenas is considered a reference point for several medical specializations and it receives pregnant women from different cities of the South of Minas Gerais state to assist them in the prenatal treatment and during their delivery.

The presence of risk factors such as a previous record of neurodegenerative diseases, autoimmune illnesses, immunosuppressive drug user mothers and a twin pregnancy were considered factors of exclusion in the study.

Pregnant women who agreed to participate to this study signed an "informed consent form" authorizing their socioeconomic, clinic, behavioral and psychological analyses. The application of a general assessment questionnaire was conducted by the researchers in the location were the prenatal treatments took place; they were responsible for the questions submission and for the questionnaire fulfillment. The submission form was standardized.

The presence of anxious symptoms was determined by a trait-state anxiety inventory during the third pregnancy quarter according to the methodology previously established [2, 5]. Once we got every pregnant women's questionnaire result, the average of the values gotten was obtained. The pregnant women who showed anxiety values bigger than the average were considered anxious.

Depression symptoms were determined by the application of a depression mass population screening questionnaire of the center of epidemiological studies (CES-D). The questionnaire owns an index of 0–60 points and pregnant women who showed an equal or a bigger score than 16 were considered depressed [8]. Importantly, the participants completed the questionnaires themselves.

Table 1 Socio-economic characteristics of pregnant women who carried out a prenatal treatment in the city of Alfenas from December 2011 to March 2013

Variable	*N*	%
Marital status		
Stable relationship	141	68.1
Unstable relationship	66	31.8
Schooling		
<7 years	59	28.1
>7 years	147	71.3
Family income per capita		
Less than a minimal wage	119	58.6
More than a minimal wage	84	41.4
Housing situation		
Owned	122	59.2
Rented or given	84	40.7

Alfenas, 2014

Table 2 Clinic and obstetrical characteristics of pregnant women who carried out a prenatal treatment in the city of Alfenas from December 2011 to March 2013

Variable	N	%
Treatment carried out		
No	186	9.7
Yes	20	90.3
Using continuously medicines		
No	171	82.6
Yes	36	17.4
Regular menstrual cycle		
No	63	30.4
Yes	144	69.6
Complications in the last pregnancies		
Abortion	37	17.8
Prematurity	14	6.7
Low birth weight	10	4.8
Using contraceptive methods		
No	73	35.3
Yes	134	64.7
Parity		
Primipara	98	47.3
Multipara	109	52.7
Delivery interval		
<2 years	20	17.9
>2 years	92	82.1
Current pregnancy planned		
No	114	55.1
Yes	93	44.9

Alfenas, 2014

A database in the EpiData 3.4 software (EpiData Association, Odense, Denmark) was created with data from clinical and nutritional anamneses questionnaire and with the STAI A and the CES-D scale scores. Data statistical analyses were realized using a SPSS 16 software.

The association between the collected variables in the general assessment questionnaire and the ones gotten by the STAI A and CES-D scales was studied initially through a univariate analysis. Variables that showed an association with a $p < 0.20$ were analyzed by a multivariate logistic regression. The significance level adopted was 0.05 for all statistical tests.

The research was approved by the Research Ethical Committee of the Federal University of Alfenas, protocol No 004/2012.

Results

The final sample was formed by 207 pregnant women who filled in a general assessment questionnaire and by a variable number of pregnant women that answered the CES-D ($n = 204$), STAI A-trait ($n = 203$) and STAI A-state ($n = 176$) scale questions.

The general assessment questionnaire provided information on risk factors to which pregnant women were exposed to. The average age was 25.5 ± 5.9 DP years and the population studied can be considered as belonging to low-income standards, since all the pregnant women lived with an income smaller than a minimal wage per capita. The possible risk factors evaluated are demonstrated in the Tables 1, 2 and 3.

Concerning anxiety and depression questionnaires, results show that the prevalence of depression was the biggest value (73.5 %) followed by state anxiety (58.5 %) and finally by trait anxiety (53.2 %) (Table 4).

Table 3 Nutritional characteristics of pregnant women who carried out a prenatal treatment in the city of Alfenas from December 2011 to March 2013

Variable	*N*	%
Nutritional status		
Adequate	114	58.2
Inadequate	82	41.8
Coffee consumption		
No	105	50.7
Yes	102	49.3
Tea consumption		
No	179	86.5
Yes	28	13.5
Alcoholism		
No	171	82.6
Yes	36	17.4
Tobacco smoking		
No	188	9.2
Yes	19	90.8

Alfenas, 2014

Table 4 Prevalence of anxious and depressive symptomatology during pregnancy

Symptoms	*n*		%	
	Yes	No	Yes	No
Depression	150	54	73.5	26.4
Trait anxiety	108	95	53.2	46.8
State anxiety	103	73	58.5	41.5

Alfenas, 2014

Table 5 Trait anxiety univariate analysis

Variables	Odds ratio	IC 95 %	*p*
Realizing some treatment ($n = 202$)			
Yes	2.93	1.02–8.41	0.045
No	1		
Using medicine continuously ($n = 203$)			
Yes	2.30	1.06–4.97	0.034
No	1		

Alfenas-MG, 2014

To explain the high prevalence of depression and anxiety, according CES-D and STAI A-trait, found in this study, a logistic regression of the collected data together with each of the corresponding outcomes of interest was realized. However, none of the studied variables could explain the occurrence of depression and state anxiety among pregnant women and thus only trait anxiety showed associated variables in the univariate analysis (Table 5). In the multivariate analysis, only the realization of a treatment for some chronic pathologies proved to be statistically associated to trait anxiety; odds ratio (2.93); confidence interval 95 % (1.02–8.41) and *p* (0.045). Also identified the usage of continuous prescription drugs as associated; odds ratio (2.30); confidence interval 95 % (1.06–4.97) and *p* (0.034). There were no association of depression and anxiety with low birth weight.

Discussion

According to the world health organization (WHO), anxiety and depression disorders are considered public health problems due to their high prevalence during pregnancy [9].

In general, the prevalence of depression detected in Brazilian pregnant women is between 12.9 and 20.8 % and the prevalence of anxiety reported was around 24 % [7, 10–16]. On the other hand, in the developed countries the

prevalence of gestational anxiety is 10 %, while the prevalence of depression is around 2.8–17 % [17].

Thus, the prevalence of anxiety and depression in the present study is bigger than that one found in developed countries and than the ones previously reported in other studies done in Brazil, too.

According to Almeida et al. [18], the high score of mental disorders among pregnant women finds support in the literature when related to populations belonging to low-income standards. In this research the majority of pregnant women lived with an income smaller than a minimal wage and this classify them as belonging to low-income standards; among these women pregnancy can be configured as a period of fear and uncertainty and thus the costs for health, education and living are quite high. Furthermore, it has to be considered that the violence affects this group more significantly.

These conditions of depression and anxiety can appear when stressing stimulus is not solved quickly and the organism does not restart its normal homeostasis.

Several studies suggest that prenatal stress can have long lasting effects on gestational time and on fetal growth and can even be responsible for behavioral and cognitive alterations; besides, child's attention deficit can be due to the same cause, too [19–22].

It can be observed that in the present study pregnant women showed high scores of anxiety and depression during their pregnancies and thus it is important to determine the risk factors which they were exposed to and that could explain this high prevalence. However, the variables studied could not explain the symptoms of depression and state anxiety among the pregnant women. In this context, only trait anxiety, or in other words, that one showed some time before the interview was associated to the realization of a treatment for any type of chronic disease and continuous prescription drugs. So women in treatment and drug use during pregnancy are more likely to be anxious.

It may have been exaggerated the prevalence of depression and anxiety in study by relying entirely on the score from the screening questionnaires. To obtain a more precise diagnosis, future studies should further assess major depressive episodes in pregnants by a professional using specifics criteria.

A chronic disease can be defined as a health impairment that follows a person for a long period, can represent a threat for his life projects and can even cause restrictions for him; thus, in most of the cases a strict control on his life style and a constant watch on its signals and symptoms have to be kept [23, 24].

Therefore, pregnant women that show any chronic disease that requires a treatment have to receive medical and psychological support together with adequate cares that they have to follow. This will assure a tranquil gestation and will diminish the chances of developing anxiety symptoms which are harmful for their health and for the fetus' one.

The intercorrelation between the symptoms accessed by STAI and CES-D questionnaire has not been studied. In this way, it is impossible to declare if the presence of one symptom can improve the chance of developing the other one, in this study.

Longitudinal studies are interesting and necessary for the continuation of future works. Follow-up studies must be carried out to investigate psychological factors more in depth. Qualitative data (including valid depression and anxiety predictors) on the suffering perceived by participants will be able to provide information complementary to the one obtained by validate questionnaires.

The importance of the maternal and fetal health has called the attention of many researchers and governmental organs like Brazilian Ministry of Health which has recently given a special importance to the intrauterine life phase, creating new strategies that aim to guarantee the pregnant woman's attendance in all the medical checkups of the prenatal treatment by a financial aid. This action is part of a program called *Rede Cegonha* whose purpose is to assure an adequate, safe and humanized medical attendance starting from a family planning and a pregnancy confirmation, then going through a prenatal treatment and a delivery and finally giving a total attention to the baby's health conditions in his first 2 years of life [25].

These strategies aim to reach one of the millennium's objectives proposed by the United Nations that is to improve maternal health [26]. Thus, a diagnosis and an adequate attendance and care of women that show anxiety and depression diseases during their pregnancies can guarantee positive gestational results and have a beneficial impact for the infantile maternal health, provoking positive effects on the health indicators and so reaching the objectives proposed by the United Nations and by the Federal Government.

Acknowledgments The authors would like to thank to Dr. Boaventura Passos Vinha, Dr. Talles Dias Orsi, Dra. Luciana Cavalcanti Michelutti, Santa Casa de Misericórdia Nossa Senhora do Perpétuo Socorro—Alfenas/MG, Fundação de Amparo à Pesquisa de Minas Gerais (FAPEMIG) and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES).

Conflict of interest The authors report no conflicts of interest.

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