PREVALENCE AND PSYCHOSOCIAL BACKGROUND OF ANXIETY AND DEPRESSION EMERGING DURING THE FIRST TRIMESTER OF PREGNANCY: DATA FROM A HUNGARIAN POPULATION-BASED SAMPLE

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SUMMARY

Background: There are few surveys of antenatal depression and anxiety in Eastern-European countries. The aim of the present study was to gather prevalence data from a Hungarian sample and to search for associations between antenatal depression/anxiety and some psycho-social variables.

Subjects and methods: A population-based monitoring system was created, covering every pregnant woman in the town of Szombathely, Western-Hungary for symptoms of depression and anxiety during the first trimester of pregnancy. Data were gathered in the period February 1, 2008 - February 1, 2010. Five-hundred and three pregnant women were included in the sample under survey.

Results: Mean age of our participants was 29.8 yr. (SD=4.94/). One fifth (19.9%; 95%CI = 16.6-23.6) of pregnant women were suffering from mild to severe depression as measured by the Beck Depression Inventory. Frequency of severe depression was low (1.4%). 14.2% of the sample (95%CI =11.5-17.6) showed signs of trait anxiety as measured by the Spielberger Inventory. Mean scores for depression and anxiety proved to be significantly higher among women who were unemployed, less than 20 years of age, having low educational or/and socio-economic status, and displaying higher level of social mistrust. Those living in common-law marriage had more depressive symptoms while reciprocity was associated only to anxiety.

Conclusions: Except for prevalence of severe depression, our data did not differ from prevalence found in market economic countries. Teen age, unfavourable socio-economic conditions and high social mistrust were associated with the emergence of clinically meaningful depression and anxiety during the first trimester of pregnancy.

Key words: suicide - public opinion - lay people - health personnel

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INTRODUCTION

Depressive and anxiety disorders are the most common psychiatric conditions in pregnancy. According to international data from developed countries, prevalence of antenatal depression is 2.8-17%, while prevalence of antenatal anxiety is approximately 10% (Evans et al. 2001, Bennett et al. 2004, Gavin et al. 2004, Heron et al. 2004). Antenatal psychiatric disorders are more common in developing countries, and also with lower socio-economic or educational strata in developed countries (Faisal-Cury & Rossi Menezes 2007, Orr et al. 2008). However, there are still few prevalence data for such disorders in low-income Eastern-European countries.

It is well-established that antenatal depression increases the risk of preterm birth and low birth weight.

Antenatal anxiety is associated in a similar manner to higher risk of preterm birth, decreased 1- and 5-minutes Apgar score, and increased arterial uterine resistance (Dayan et al. 2002, Dayan et al. 2006, Orr et al. 2007, Teixeira et al. 1999). Pregnant women having symptoms of depression or anxiety report more somatic problems and consult their physicians more frequently (Andersson et al. 2004). However, there are studies reporting no significant impact of antenatal depression and anxiety on birth outcomes (Andersson et al. 2004, Berle et al. 2005). Contradictory findings can be explained either by differing methodologies or by the confounding role of demographic and other psycho-social covariates. Most of the studies on prenatal depression and anxiety have included basic demographic indices; however, other possibly relevant background psychosocial factors have often been omitted.

Compiling social trust, reciprocity and civil support, social capital is an important background psycho-social factor in the genesis of/resistance to antenatal psychiatric disorders. Low level of social capital (probably via chronic stress) is related to poorer self-related health, lack of openness towards primary health care, higher anxiolytic-hypnotic drug use and even higher mortality in middle age (Johnell et al. 2006, Subramanian et al. 2002, Lindström & Axén 2004).

Although the association of antenatal depression and anxiety to negative birth/neonatal outcomes is still controversial, these conditions surely lay a heavy burden on both the individual and society. Thus, it is extremely important to know more about their background factors in order to plan new preventive measures.

Based on the above-mentioned data, the aim of the present study was to assess the prevalence of antenatal depression and anxiety and to reveal their associations with demographic and psycho-social indices by studying them in a Hungarian population-based sample.

SUBJECTS AND METHODS

Subjects

The population-based survey was carried out in Szombathely, Western Hungary, a municipal town with 80.100 inhabitants. There is a network of 18 nurse districts in the town where each nurse is responsible for the registration and health care of all pregnant women living in her district. A territorially circumscriptive population monitoring system was set up from ten of the eighteen districts where data collection was continuous between 2008 and 2010.

Registration of pregnancy was based on the gynaecologist's diagnosis. Pregnancies were diagnosed on average in the 8th gestational week (8.2 ± 4.5 weeks). Data were collected during registration for prenatal care at the first visit at the district nurse's office. Women were interviewed by trained district nurses who filled in standard questionnaires. Informed consent was signed at the same time, and participation was voluntary and anonymous. The study protocol had been previously approved by the Regional Research Ethics Committee of the Medical Centre of Pecs University (15-3460/ 2007). The women on pharmacological treatment for severe psychiatric diagnoses or those who were unable to understand the questionnaire (due to lack of command of the Hungarian language or extremely restricted cognitive ability) were excluded from the study; 9.2% of the interviewed 554 pregnant women refused to participate. Thus, 503 women were enrolled in the study.

Methods

Depressive symptoms were measured by the shortened, 9-item version of the Beck Depression Inventory adapted to Hungarian conditions (Short Hungarian Version of the Beck Depression Inventory) (Beck et al. 1961, Skrabski et al. 2005). Scores of this shortened scale had been converted to scores of the original inventory. Anxiety was assessed by the trait-anxiety block (STAI-T) of the Hungarian version of the Spielberger State-Trait Anxiety Inventory form Y (Spielberger et al. 1970, Sipos & Sipos 1983). Because the STAI-Y was not designed or validated to be used with a cut-off score, the scores were kept in their continuous form for the statistical analysis. For epidemiological aims, we only used cut-off values from an earlier Hungarian research: 1) STAI-T <48: no anxiety; 2) STAI-T>52: clinically significant anxiety; 3) STAI-T= 48 to 52: mild or sub-clinical disorder (Stauder & Kovács 2003).

The following demographic variables were registered: age, marital, educational, employment and socio-economic status. Socio-economic status was measured by the Family Income Assessment Scale, a widely used validated Hungarian questionnaire consisting of four questions: 'How many computers do your family own?' 'Does your family own a car or a lorry?' 'How often have you been on holidays with your family in the last twelve months?' and 'Does the oncoming child have his/her own private room?' Answers on each item can be converted to numerical scores in the following way: computer ownership: none = 0, one = 1; two = 2; more than two = 3; car ownership: none = 0, one = 1; more than one = 2; holidays: never = 0, once = 1; two times = 2; more than two times = 3; child's own room: no = 0; yes = 1. Total scores (from minimum = 0 to maximum = 9). Scores on this scale were categorized by the following standard way: 0-1 = 'lower', 2-4 = 'lower-middle', 5-7 = 'upper-middle' and scores 8-9 = 'upper' categories (Aszman 2003).

Following Putnam (Putnam 1993) and Kawachi (Kawachi et al. 1997), individual components of social capital were measured by three items concerning levels of social trust, perceptions of reciprocity and support received from civic and religious organisations. Each component was measured by scores on a 0 to 3 scale according to agreements with the following statements: "People are selfish and they try to assert themselves at others' expense"; "Good work is expected to be reciprocated"; (answers: 0= I fully disagree, 1= I agree to a less extent; 2= I agree to a moderate extent; 3=I agree completely); "How much civil support can you expect?" (answers: 0= none, 1= little; 2= moderate; 3=as much as possible) (Skrabski et al. 2004).

Statistical analysis

Statistical computation was performed by SPSS software (Statistical Package for Social Sciences) 11.5 for Windows with a level of significance $p < 0.05$. Prevalence of depression and anxiety were assessed together with their 95% Confidential Interval (95%CI), while associations between depression, anxiety and their background factors were tested by One-Way-ANOVA (Scheffé post hoc test).

Tamás Bödecs, Enikő Szilágyi, Péter Cholnoky, János Sándor, Xénia Gonda, Zoltán Rihmer & Boldizsár Horváth:
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RESULTS

Demographic distribution of the sample

Participants were between 15-47 years of age, (mean =29.83±4.94/). More than half of them were married (60.0%), and as much had received secondary or higher education. As to their socio-economic status, 89.7% of the respondents regarded their own or their families' financial condition as belonging to the lower-middle or to the higher-middle class (Table 1).

Prevalence of antenatal depression and anxiety

The mean score of the Short Hungarian Version of the Beck Depression Inventory was 6.03±6.67 points. Applying the standard threshold values of the questionnaire, 19.9% of the participants reported a certain level of depressive symptoms (16.1% mild, 2.4% moderate, and 1.4% severe depression). In other words: one in twenty pregnant women suffered from depression. The mean anxiety score was 39.46±7.76, and 9.8% had mild or sub-clinical, while 4.4% suffered from clinically significant trait anxiety (Table 2.)

Table 1. Prevalence of demographic variables

	No.	%
Age		
<20 years	15	3.0
20-35 years	440	87.6
>35 years	47	9.4
Marital status		
Single/divorced	32	6.4
Common law marriage	166	33.1
Married	304	60.6
Education		
Less than vocational	64	12.8
Vocational	51	10.2
Secondary	174	34.9
Higher/university	210	42.1
Socio-economic status		
Lower	40	8.0
Lower-middle	269	53.5
Upper-middle	179	35.6
Employed		
No	63	12.6
Yes	436	87.4

Table 3. Associations between antenatal depression and psychosocial background factors

	Beck Depression scores						
	Mean	(SD)			Mean	(SD)	p
Age (p<0.05)							
<20 years	10.560	(6.93)	vs	20-35 years	5.990	(6.62)	(p<0.05)
			vs.	>35 years	5.060	(6.67)	(p<0.05)
Marital status (<0.01)							
Common law marriage	7.520	(8.24)	vs.	Single/divorced	6.917	(5.75)	ns.
			vs.	Married	5.140	(5.59)	(p<0.05)
Education (<0.01)							
Less than vocational	9.065	(11.23)	vs.	Vocational	5.163	(4.89)	(p<0.05)
			vs.	Secondary	5.209	(5.37)	(p<0.05)
			vs.	Higher	6.003	(5.95)	(p<0.05)
Socio-economic status (<0.01)							
Lower	9.903	(9.70)	vs.	Lower- middle	5.448	(6.40)	(p<0.05)
			vs.	Upper-middle	6.209	(6.13)	(p<0.05)
			vs.	Upper	4.039	(3.98)	(p<0.05)
Employed (p<0.01)							
No	8.280	(7.18)	vs.	Yes	5.730	(6.56)	(p<0.01)
Social trust (<0.01)							
I agree to less extent	4.278	(4.80)	vs	I disagree	5.419	(10.52)	
			vs.	I agree to moderate extent	6.650	(6.59)	(p<0.05)
			vs.	I agree completely	7.136	(6.25)	(p<0.05)
Reciprocity (ns.)							
I agree to less extent	5.000	(5.33)	vs.	I disagree	5.062	(5.74)	
			vs.	I agree to moderate extent	5.953	(7.33)	
			vs.	I agree completely	7.080	(6.70)	
Civil support (ns.)							
None	7.573	(9.71)	vs.	Little	8.304	(8.78)	
			vs.	Moderate	5.478	(7.00)	
			vs.	As much	as possible	6.065	

Table 2. Prevalence of antenatal depression and anxiety

	No.	%	(95%CI)
Depression			
None	403	80.1	(83.4)
Mild	81	16.1	(13.2-19.6)
Moderate	12	2.4	(1.4-4.2)
Severe	7	1.4	(0.7-2.8)
Anxiety			
None	427	85.8	(82.4-88.5)
Mild	49	9.8	(7.5-12.8)
Severe	22	4.4	(2.9-6.6)

Associations between antenatal depression, anxiety and their background factors

Women in the youngest age group (below 20 years of age) showed higher level of depression than older women (age 20–35, and above 35). Similar distribution of anxiety levels was found for the youngest and the oldest age group. Participants living in common-law marriage scored higher for depression than married women. Women of lower than vocational level education had more symptoms of anxiety than those with high-school and university grades, and had higher depression scores than women of all other educational levels. Those in the lowest socio-economic stratum exhibited higher level of depression and anxiety than participants belonging to any other category. Unemployed women had higher levels of depression and anxiety than those who had jobs.

Concerning the elements of social capital, civil support affected neither antenatal depression nor anxiety. Those who expected that their good deeds had to be reciprocated showed higher anxiety scores. Social mistrust had the most serious impact: those who considered other people to be selfish showed higher levels of depression and anxiety than those who disagreed with this statement.

Table 4. Associations between antenatal anxiety and psychosocial background factors

	Mean	(SD)			Mean	(SD)	p
Age (p<0.05)							
<20 years	44.07	(7.32)	vs.	20-35 years	39.47	(7.72)	ns
			vs.	>35 years	38.02	(7.81)	(p<0.05)
Marital status (<0.01)							
Common law marriage	39.79	(7.57)	vs.	Single/divorced	41.16	(8.36)	ns
			vs.	Married	39.09	(7.81)	ns
Education (<0.01)							
Less than vocational	42.28	(8.16)	vs.	Vocational	38.52	(6.05)	ns
			vs.	Secondary	39.31	(7.33)	ns
			vs.	Higher	38.97	(8.22)	(p<0.05)
Socio-economic status (<0.01)							
Lower	43.93	(6.55)	vs.	Lower- middle	40.22	(7.89)	(p<0.05)
			vs.	Upper-middle	37.58	(7.29)	(p<0.05)
			vs.	Upper	36.00	(6.85)	(p<0.05)
Employed (p<0.01)							
No	42.16	(7.85)	vs.	Yes	39.08	(7.70)	(p<0.01)
Social trust (<0.01)							
I agree to less extent	38.63	(7.82)	vs	I disagree	36.47	(8.01)	ns.
			vs.	I agree to moderate extent	39.69	(7.46)	(p<0.05)
			vs.	I agree completely	42.03	(7.98)	(p<0.05)
Reciprocity (<0.05)							
I agree to less extent	37.66	(7.28)	vs.	I disagree	39.58	(7.33)	ns.
			vs.	I agree to moderate extent	39.58	(7.33)	ns
			vs.	I agree completely	40.76	(7.54)	(p<0.05)
Civil support (ns.)							
None	41.92	(7.83)	vs.	Little	41.92	(7.83)	ns.
			vs.	Moderate	39.22	(6.91)	ns.
			vs.	As much	39.16	(8.17)	ns.

Anxiety scores column header spans Mean/(SD).

DISCUSSION

Prevalence data of a recent survey of antenatal depression and anxiety did not differ from prevalence rates found in industrialized countries (Bennett et al. 2004, Evans et al.2001, Gavin et al. 2004, Heron et al.2004). Since there are no similar, comparable population-based data for pregnant women in Hungary we had to compare our data to the prevalence rates found in a representative sample of young or middle-aged Hungarian women (Csoboth 2006, Purebl & Kovács 2006). The authors have found that the composite rate of depression (measured by the Beck Inventory) among Hungarian women aged 18 to 44 years was 19.8% (mild: 13.0%, medium: 4.0%, and severe: 2.8%). Our composite results are exactly the same (19.9% vs. 19.8% depression of any severity) but we found much lower rates of severe depression (1.4% vs. 2.8%, a two-fold difference). Prevalence rates of trait anxiety proved to be nearly the same (14.2% vs. 12%) (Szádóczky et al. 1997). This could possibly be a consequence of the fact that 94% of our pregnant women were married or were living in common-law marriage.

Our findings find support in numerous international studies which clearly demonstrate that very young age, poor income, unemployment, lack of education and adverse marital conditions are among the main risk factors for the development of psychiatric disorders. On the other hand, social capital and good family support can act as a protective factor, a kind of psycho-social buffer (Rick-Edwards et al. 2006, Kazi et al. 2006, Glazier et al. 2004, Lee et al. 2007, Marchesi et al. 2009).

Pregnancy induces hormonal and autonomous alterations that can exacerbate both depression and anxiety. Hyperactive CRH system also with hypo-thalamic-pituitary-adrenocortical (HPA) axis overdrive is commonly associated with depression. Inverse modifications of the activity of the HPA axis may also be found in anxiety disorders, particularly with hypo-cortisolism instead of hypercortisolism. (Arborelius et al. 1999, Reul & Holsboer 2002) However, we must not forget that, besides physiological changes, pregnancy brings on many psycho-social changes, too. New challenges, higher expectations, graver responsibilities, decline of social status, isolation may also lead to depression or anxiety, especially if poverty, social distrust and lack of civil support exist in a common context (O'Keane & Marsh 2007). These pathways (physiologic and psycho-social) cannot be separated, they interact in many ways: psycho-social deprivation may augment physiologic changes, and conversely, beneficial psycho-social conditions can mitigate these hormonal-autonomous alterations.

The most plausible explanation of the mechanisms which underpin our findings is that pregnancy, with all its bodily and lifestyle perturbations, is a stressful period. Being normally and hopefully a positive event, it can easily convert to distress (Geller 2004). Poverty, poor education, joblessness, very young age, and adverse domestic conditions can make women feel that they are unable to cope with the new situation. Debilitation of behavioural stress response (inefficient coping) can lead to enhanced physiological stress response (hormonal and autonomous alterations) (Roesch et al. 2002, Van Praag 2004, Pakenham et al. 2007). Several studies suggest that the synthesis and the release of placental CRH are stimulated by stress hormones (Petraglia et al. 1989, Chan et al. 1993), while as it was mentioned above, consequent alterations in the HPA axis may exacerbate depression or anxiety.

Prevention must be focused on these social risk factors; however, improving them is not easy. Demographic indices like low educational level, low income and environmental adversity cannot be dramatically changed in the relatively short period of pregnancy and anyway, they would require extreme human and financial expenditure. On the other hand, psycho-social factors such as social capital, which have their roots in a firm social network but act through cognitive processes, seem to be more reasonable targets on which to focus health-enhancing interventions.

Family and civil support were found by others to reduce stress levels (Glazier et al. 2004, Kazi et al. 2006). However, we did not find them to offer protection against depression or anxiety. We found that social distrust and high expectations of reciprocity correlate with increased levels of depression or anxiety. Since we found no significant interrelations between the various components of social capital, we do not support the notion that social distrust and reciprocity are joint confounders of civil support but believe that they act as independent covariates. Although it seems to be reasonable to suggest that those who have higher expectations of others and feel that people around them are selfish undergo more stress, further studies are still needed to uncover in more exact detail the explanatory underlying mechanisms.

Limitations

Our well organized population monitoring provides a clear picture of a given Hungarian settlement but our prevalence data may not represent the whole Hungarian population. Further limitation is the relatively low number of cases and the lack of data from the non-responders. If incidence of psychic disturbances is different in non-responders our results may be distorted. Another limitation is that while the Short Hungarian Version of the Beck Depression Inventory has validated cut-off values, such values are absent in the Hungarian version of the Spielberger State-Trait Anxiety Inventory form Y (STAI-Y), and so we were compelled to use cut-off points from a former Hungarian survey. No clinical diagnoses were obtained, since they can only be established through clinical encounter; however, our

questionnaires on depression and anxiety are widely used, internationally accepted, and validated even for Hungarian conditions. A further limitation is that we measured social capital and antenatal depression/anxiety simultaneously, and so it is remains unclear whether distrust or reciprocity will lead to depression/anxiety, or it works in the opposite way: depression and anxiety result in social distrust and the feeling that good deeds have to be reciprocated.

CONCLUSIONS

The strong points of the present study are that data were obtained from a solid population- based survey. We have presented novel data for the prevalence rates of antenatal depression and anxiety in a population-based sample from a low-income Eastern European country. The findings shed light on some important associations of antenatal depression/anxiety to demographic indices as well as to components of the social capital construct. We have found for the first time that it is not lack of civil support, but lack of social trust and higher expectations on reciprocity that impact upon antenatal depression and anxiety.

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