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Research Paper

Association study of obstetrical complication and depressive disorder

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Abstract

Objective: To investigate the correlation between obstetrical complications and depressive disorder. **Methods:**Depressive disorder probands and their adult sibling were diagnosed using CCMD-3 criteria. Obstetrical data from maternal reports were scored, applying published scales that take into account number and severity of complication. **Results:**The scores of obstetric complication and prenatal complications and low birth weight were significantly worse in probands than siblings without depressive disorders. **Conclusion:** Results suggest obstetric complications are etiologically significant in depressive disorder.

Key words: depressive disorder; risk factor; obstetric complication; mood disorder

INTRODUCTION

Mood disorders are a group of mental disorders characterized by obvious and persistent elation or depression of mood. Depressive disorder which is one form of mood disorders is characterized by depressed mood that is out of keeping with the circumstances. The cause of depressive disorder is unknown, although many studies have investigate that the biopsychosocial contribution may have great affect on depressive disorder[1-2]. Obstetrical complications(OCs) are used here in the way that McNeil has defined them as the; "broad class of somatic deviations from an expected, normal course of events and offspring development during pregnancy, labor-delivery, and the early neonatal period". OCs have been reported to have a significantly elevated prevalence compared with controls in a number of psychiatric disorders, especially in schizophrenia[3-4]. A few studies have revealed that OCs' incidence of mood disorder is higher than controls. Done et al[5] reported that a sample of patients with mood disorder from the United Kingdom had significantly higher rates of OCs that are associated with perinatal complications than did the general population of subjects from the same large birth cohort. Bain et al[6] reported abnormal presentation has correlation to mood disorder. There are also a few active studies that aim directly at the relationship between depressive disorder and OCs. Preti et al[7] have cautioned that depressive disorders were more likely than controls to be small for their gestational age and they were significantly more likely than controls to have suffered at least one OC. Christopherth et al[8] found infants' low birth weight will increase the possibility of depressive disorder. The present research had two objectives. We investigated whether there is correlation between OCs, depressive disorder and the correlation between OCs and the severity of depressive disorder. We also tested which specific OC may have a powerful relationship to depressive disorder.

MATERIALS AND METHODS

Proband and comparison

Thirty probands with depressive disorder including 12 males were recruited from West China Hospital Mental Health Center's inpatient units(hospitalized from March to September in 2006). All thirty probands were diagnosed by experienced diagnosticians using criteria CCMD-3. Their average ages at first given hospitalization diagnosis for the disorder was 20.3, (their average age at this time was 25.4). There were 7 patients

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who were first hospitalized for depressive disorder. 30 probands were checked by HAMD questionnaire to assess the severity of depression, their average score being 27.4.

Control Subjects were composed of every patient's sibling. Siblings with either mood disorders or other psychotic disorder were excluded from the comparison group. Their average age was 30.7, including 14 males.

Assessment for OCs

First we obtained signed informed consent from the subject and their mothers. Then each mother was asked to list all of her pregnancies and their dates, and for each child to specify length of the pregnancy and labor, maternal weight gain during pregnancy, and birth weight of the child, among other items. In addition to being asked about general types of obstetrical information, we also asked mothers about several specific types of complications, such as vaginal bleeding, maternal infections or exposure to teratogenic drugs during pregnancy, preeclampsia, forceps delivery, general anesthesia, problems experienced by the neonate such as respiratory distress or intensive care, and so on. We emphasized to mothers that it was important to be candid and objective in their reports, and that they should report as thoroughly as possible of their children. Mothers were also cautioned not to mention any psychiatric problems their children may have had in connection with their reporting of OC data, to avoid possibly biasing the OC rating(***Tab 1***).

Tab 1 **Correlation between Ocs and depressive disorder and relationship between OCs and the severity of depressive disorder**

	Correlation between Ocs depressive disorder		Relationship between OCs and HAMD scores	
	t value	*P* value	*r* value	*P* value
OCs($n = 28$)	96.5	<0.02	1.179	>0.05
Prenatal complications ($n = 26$)	91.5	<0.05	2.306	>0.05
Perinatal complications ($n = 26$)	108	>0.05	0.840	>0.05

The obstetrical data were scored by applying a scale that were designed by the obstetrician F. Fuchs which have been used in many published studies[9]. The scales provide summary scores of OCs, based on the algebraic sum of the number and relative severity of various complications, with more severe complications being given a higher weight. The various OCs along with the respective severity weights used in calculating OC summary scores, are listed in ***Tab 2***.

Statistics method

We used Wilcoxon tests to check the correlation between OCs and depressive disorder and we used Spearman correlation coefficients to test the correlation between OCs and the severity of depressive disorder applying SPSS 13.0 software. For strict testing, we used two-tailed tests.

RESULTS

The overall mean OC score was significantly higher in probands than their siblings($P < 0.02$). Summary scores for prenatal OCs were higher in depressive disorders than in their siblings($P<0.05$), while summary scores for perinatal OCs were not higher than comparison subjects. The correlation scores for OCs against the severity of depressive disorder didn't demonstrate statistical power. These findings are listed in ***Tab 1*** and ***Tab 2***. We also found the relationship between prematurity, low birth weight and depressive disorder was found to be present($OR = 3.857\ 1$, $P < 0.05$).

40% probands have severe OC scores(6 or greater on the scale), compared with only 1 of the siblings. At the other extreme, only 4 of the probands(compared with 10 of their siblings) had either no OCs or only one very mild OC.

DISCUSSION

The excess of OCs and prenatal OCs including low birth weight found in patients with depressive disorder compared with their own siblings provides further evidence that OCs and prenatal OCs(including low birth weight) are important risk factors for depressive disorder. It is also conceivable that the higher obstetical rates found in depressive patients are a pleiotropic effect of genes that may lead to depressive disorder. This hypothesis seems unlikely in view of the fact that siblings share half their genes in common with the probands, so we can remove the genes effect.

The causes of depressive disorder are still as yet not completely understood. Adverse life events often are the proximal cause of a depressive illness, but act selectively on vulnerable individuals[10-11]. Although a genetic predisposition is usually postulated, genes identified reliably as yet are still undefined[12-13]. Some estimates place the heritability at only 36%-44% in women and rather less in men[14-15]. Thus, there must be other biological factors leading to the predisposition to depression.

Another factor may be fetal undernutrition, leading to low birth weight. Brown et al[16-17] reported a second-trimestre exposure to famine conditions was associated with an increased risk for mood disorder in later life. The scores of OCs and prenatal OCs including low birth weight suggest fetus may be subject to undernutrition.

A Fetus' development in the uterus mainly depends on hormones. Lack of hormones externalization may cause fetal undernutrition. The drop of the plasma

Tab 2 **Comparison of probands with depressive disorders and their controls**

OCs	Scoring weight	Probands	Controls	*OR*	*P* value
Prenatal					
Anemia	2	5	6	0.8	>0.05
Bleeding/spoting	2	10	5	2.5	>0.05
Maternal age under 16 years or over 34 years	1	7	6	1.217 3	>0.05
Maternal influenza in 2nd trimester	2	11	8	1.592 1	>0.05
Maternal third-degree burns	3	0	0		>0.05
More than four previous pregnancies	2	3	2	1.555 6	>0.05
More than one prior miscarriage	1	17	14	1.494 5	>0.05
Mother hospitalized for dehydration,ear infection or ileitis	1	5	5	1	>0.05
Pre-eclampsia	2	7	4	1.978 2	>0.05
Prematurity and low birth weight		9	3	3.857 1	<0.05
Mild,birth weight 2 000-2 500g	2	5	3		
Moderate,birth weight 1 500-2 000 g	3	4	0		
Severe,birth weight<1 500 g	4	0	0		
Rubella in 1st trimester		0	1		
Probable	2	0	0		
Definite	3	0	1		
Teratogen exposure		11	12	0.868 4	>0.05
Probable	3	11	12		
Definite	4	0	0		
Perinatal					
Breech	1	3	2	1.555 5	>0.05
Breech(extraction)	3	2	2	1	>0.05
Caesarian section:		10	12	0.75	>0.05
Elective	1	8	10		
Emergency	3	2	2		
Drugs used to stimulate labor	2	17	17	1	>0.05
Excess bleeding after delivery	1	2	3	0.642 8	>0.05
Forceps		5	4	0.642 9	>0.05
Low	1	5	4		
Marks	2	5	4		
Fratured skull with cephalohematoma	4	0	0		
Genaral anesthetic		1	1	1	>0.05
Ether	2	0	0		
Other	1	1	1	1	>0.05
Labor somewhat prolon1ged(16-24 h for multiparous)	2	8	6	1.454 5	>0.05
Labor very prolonged(>24 h for multiparous)	4	1	0		
Labor precipitate	2	1	0		
Neonatal jaundice	1	2	2	1	>0.05
Neonatal kept in intensive care for several days after birth	2	2	1	2.071 4	>0.05
Respiration delayed at birth	3	5	6	0.8	>0.05
Rotation of infant during delivery	1	3	3	1	>0.05
Twins	2	0	0		>0.05
Umbilical cord aroud neck tightly at birth	1	6	5	1.25	>0.05

levels of hormones would cause permanent changes of the set points of neuro-endocrine. These have been shown to occur in the hypothalamic-pituitary-adrenal (HPA), growth-hormone, thyroxine and insulin axes. These changes have a clear association to depressive disorder in community samples may cause diabetes, hypertension, stroke and cardiovascular disease[18] suggesting an as-sociation between fetal undernutrition and depressive disorder[19]. People with vulnerable genes of depressive disorder would have high risk to occur depressive disorder, if they have also suffered OCs[20].

It is therefore important to conduct further and more probing research on this topic, as this study didn't include the amount of probands we believe required for an irrefutable conclusion.

CONCLUSION

The results of the present study provide new evidence for the hypothesis that OCs are a significant risk factor for depressive disorder. These results have potentially important clinical implications. If OCs are in fact significant etiological factors for depressive disorder(e.g., because of a family history for depressive disorder) we could offer an approach to primary prevention that is extremely attractive on economical as well as ethical grounds, for example an intervention of this could be the concentration on a relatively brief period of the life span.

In summary, this study indicates that OCs are a significant risk factor for depressive disorder. New research involving patients with depressive disorder is therefore

needed to investigate the relations between OCs and other variables, such as neuropsychological test performance and brain imaging of cerebral integrity. Studies examining these relations could provide important new insights into neurobiological factors contributing to the development of depressive disorder.

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