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Prevalence and risk factors of postpartum depression in a population-based sample of women in Tangxia Community, Guangzhou

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ABSTRACT

Objective: To investigate the prevalence and analyze the risk factors of postpartum depression (PPD) in Tangxia Community, Guangzhou, a community representative of the process of urbanization in China. **Methods:** A total of 1 823 delivery women in Tangxia Community, Guangzhou were screened with the Chinese Version of Edinburgh Postnatal Depression Scale, Hamilton Depression Scale and Social Support Rating Scale. The risk factors were evaluated by self-made questionnaire based on literature interview combined with expert consultation. The data collected were analyzed using Student's t test and logistic regression in SPSS16.0. **Results:** The prevalence of PPD in Tangxia Community, Guangzhou was 27.37%. Multivariate logistic regression analysis identified mode of delivery, puerperant from one-child family, relationship between mother-in-law and daughter-in-law and fetus gender as the risk factors of PPD while housing condition was negatively correlated with the incidence of PPD with OR value of 0.82. The total score of social support rating scale, the score of objective support, subjective support and social utilization degree were significantly reduced in women with PPD in contrast with women without PPD. **Conclusions:** The incidence of PPD was slightly higher than other regions of China. It's of great importance to distinguish risk factors in regional culture context and develop health promotion program in order to enhance the well-being of delivery women.

1. Introduction

Postpartum depression (PPD) is one of the most common complications characterized by behavioral problems and mental disorders in women about 4 to 6 weeks after giving birth. It's a major public health issue which affected 10%–15% of mothers in western economically developed societies[1]. However, investigation on a border city in Iran showed the prevalence of PPD is 34.8%[2]. Another study conducted in Korea reported the prevalence of PPD 2 weeks and 6 weeks after delivery are 36.3% and 36.7% respectively[3]. Halbreich et al reviewed 143 studies in 40 countries focusing on PPD prevalence and demonstrated

the variability in reported PPD ranged from almost 0% to 60%[4]. The diverse incidence of PPD might be due to distinct time point, assessment tools, diagnostic criteria, biological vulnerability and differences in socio-economic environment and cultural background[5]. Therefore, the determination of PPD prevalence and risk factors across different culture may help identify women at risk and provide evidence for early intervention strategy.

Over the past years, there are growing literatures regarding risk factors of PPD. Though the etiology of PPD is unclear, the development of PPD is closely linked with biological, psychological, socio-economic and cultural factors. Prenatal depression is the most consistent risk factor which can predict the severity of PPD[6]. Preterm infant, responsible for 70% of neonatal mortality and morbidity can cause significantly greater maternal stress because of the infant's uncertain health. The risk of anxiety was 2.7 times higher in the mothers of preterm infants than those of fullterm infants[7,8]. In addition, chronic prenatal pain[9],

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pregnancy loss^[10], living in urban areas^[11], low self-esteem, lack of social support^[12], unplanned birth, low socio-economic status, part-time employment^[13], being left alone in labor^[14], inconsolable infant crying^[15], marital conflict are also risk factors of PPD^[16].

PPD has detrimental effects on mothers and their partners, on the interaction between mother and child, as well as on the mental development of the child^[17]. A study of service women in US armed forces revealed PPD was a strong predictor of suicidality in the postpartum period with 42.2 times the odds to be diagnosed with suicidality compared to those without PPD^[18]. Ali et al has found that a significant relationship between PPD and children's delayed mental development and the child was six times more at risk of emotional development delay relative to when the mother was not depressed^[19]. Stein et al has reported PPD significantly impaired mother–infant interactions as well as disrupted emotional and cognitive development of the infant^[20].

Since most surveys and epidemiological studies focus on prevalence and related factors in Western industrialized societies where women at risk is often recognized, there's a need to evaluate the incidence of PPD and it's culturally sensitive correlates in Chinese society especially in a community of Guangzhou, one of the most rich city in south China. Due to distinct environmental and cultural norms, it appears PPD is less prevalent within some traditional cultural settings like China, eg. a woman is tend to rest in bed for the first 4 weeks after giving birth while household chores and childcare are given by the woman's mother or relatives^[5]. The intimacy in family members may ameliorate the stress in early motherhood and strengthen the continuation of family line. However, the rush of huge migrants to the economically developed cities not only changes the location of populations, it also changes their structure, too.

Tangxia Community, located in Guangzhou, one of China's mega cities, is the epitome of Chinese economic development and the process of urbanization. With an area of 7.42 square kilometers, the community absorbed the population of more than 300 000, 80% of which is immigrants. Traditional and modern concepts are blending, south of the Five Ridges culture and other distinct regional culture are experiencing collision and fusion. At present, there're few studies on the prevalence and associated factors of PPD in immigrant communities of tropical areas in China. Although a number of documents summarized risk factors of PPD, We cannot assume the risk factors in Tangxia Community are the same with those mentioned above, because different cultural contexts count. Therefore, the purpose of this study is to assess the prevalence of PPD and examine the risk factors in Tangxia Community. Once related factors are identified, preventive measures and treatment strategies

may be developed in order to enhance the well-being of delivery women in the community.

2. Materials and methods

2.1. Investigation object

Through descriptive cross-sectional study, women of more than 18 years of age at 4 weeks after childbirth between May to September, 2013 in Tangxia Community, Guangzhou were invited to participate in the study. Women with a history or family history of mental disorder were excluded because the risk of PPD may be increased under this condition. Due to methodological concerns, women who left missing data in the questionnaire were also excluded.

2.2. Investigation method

Investigators conducted face-to-face interview for data collection. The Chinese Version of the Edinburgh Postnatal Depression Scale (EPDS) was used to assess PPD with a threshold of 13. The sensitivity and specificity of the Chinese Version of EPDS have been found to be 0.82 and 0.86 respectively which were comparable to the original scale^[21]. Women with a score of 10 or more were then experienced severity evaluation of PPD using Hamilton Depression Rating Scale for depression. A score of ≥ 7 was used to identify mild depression; A score of ≥ 17 was diagnosed with moderate depression; A score of ≥ 24 was used to distinguish severe depression^[22]. Based on literature combined with expert consultation, we designed a questionnaire concerning the related factors of PPD. Sociodemographic factors like age, marital status, occupation, education, housing condition, household income per month were examined; Biological factors such as parity, delivery mode, pregnancy associated disease, delivery related disease were explored. Information about cultural characteristics including puerperant from one-child family, relationship between mother-in-law and daughter-in-law, marriage bonds and fetus gender were investigated. Since social support of delivery women correlated with the development of PPD, Chinese Version of Social Support Rating Scale was employed to ascertain the degree of social support in delivery women^[23].

2.3. Statistical analysis

Data were double put into by the use of Epidata3.0 then statistically analyzed by SPPSS 13.0. Student's t test was used to evaluate the significance of differences between two independent-samples of categorical data. The risk factors of PPD were ascertained by single non-conditional logistic regression analysis and multivariate logistic regression

analysis. $P < 0.05$ was considered statistically significant.

This study was approved by the Research Ethics Board of Southern Medical University and all participants signed a consent form.

3. Result

3.1. Prevalence of PPD in Tangxia Community, Guangzhou

A total of 1 835 women were agreed to participate in the research, among them, 12 were excluded due to the missing questionnaire, leaving 1 823 (99.35%) for analysis.

The age of delivery women ranged from 19–42 years with mean age of (25.6±8.63) years. The prevalence of PPD in Tangxia Community, Guangzhou was 27.37%. The incidence of mild PPD, moderate PPD and severe PPD were 14.04%,

11.63%, 1.70%, respectively.

3.2. Unconditional logistic regression analysis of impact factor in women with PPD

Table 1 represents the results of single non-conditional logistic regression of the risk factors of PPD. There was a significant correlation of PPD with delivery mode, puerperant from one-child family, relationship between mother-in-law and daughter-in-law, fetus gender and housing condition.

3.3. Multivariate logistic regression analysis of impact factor in women with PPD

Table 2 shows the multivariate logistic regression analysis of the risk factors of PPD. It demonstrated delivery mode, puerperant from one-child family, relationship between

Table 1

Single non-conditional logistic regression analysis of the risk factors of postpartum depression.

Index	<i>B</i>	<i>SE</i>	Wald	<i>P</i>	<i>OR</i>	95% <i>CI</i>
Age	-2.170	1.833	1.723	0.893	1.120	0.865–1.230
Marital status	-0.089	0.172	0.198	1.324	0.928	0.836–1.135
Occupation	0.239	0.587	0.129	0.063	1.239	1.010–1.672
Education	0.145	0.022	8.931	0.092	0.845	0.568–1.109
parity	0.126	0.170	0.451	0.931	1.021	0.923–1.241
Delivery mode	0.178	0.108	17.250	0.031	1.123	0.872–1.359
PAD	0.269	1.078	1.547	0.219	1.365	1.019–1.423
DRD	-1.256	1.018	1.762	0.591	0.323	0.128–0.512
Disease of newborn	1.247	0.928	1.451	0.420	2.131	1.876–2.458
POF	0.149	0.017	13.230	0.023	1.387	1.021–1.431
RMD	0.013	0.026	8.210	0.000	2.321	2.013–2.249
Marriage bonds	0.450	0.127	0.097	0.128	1.021	0.036–1.479
Fetus gender	0.011	0.006	23.570	0.002	1.013	0.812–1.230
Housing condition	0.021	0.219	11.530	0.021	0.938	0.421–1.271
Income per capita	0.224	0.976	1.231	0.081	1.167	0.671–1.530
Constant	13.240	1.672	113.540	0.191	–	–

PDRD: delivery related disease; POF: Puerperants from one-child family; RMD: Relationship between mother-in-law and daughter-in-law.

Table 2

Multivariate logistic regression analysis of the risk factors of postpartum depression.

Index	<i>B</i>	<i>SE</i>	Wald	<i>P</i>	<i>OR</i>	95% <i>CI</i>
Delivery mode	0.157	0.116	16.821	0.024	1.131	0.921–1.215
POF	0.152	0.121	14.103	0.011	1.421	1.212–1.446
RMD	0.020	0.032	8.321	0.000	2.339	2.137–2.673
Fetus gender	0.018	0.010	26.128	0.008	1.021	0.093–1.235
Housing condition	0.097	0.371	13.270	0.011	0.820	0.551–1.310
Constant	14.781	2.134	135.75	0.013	–	–

Table 3

Scores of social support in delivery women.

	Women with PPD(<i>n</i> =499)	Women without PPD(<i>n</i> =1 324)	<i>t</i>	<i>P</i>
Overall	33.16±9.78*	57.13±13.64	-19.72	0.000
Objective support	13.21±3.14*	16.25±6.91	-8.21	0.000
Subjective support	22.19±12.04*	15.29±9.10	22.91	0.014
Social utilization degree	9.12±2.10*	12.34±3.57	8.91	0.000

* $P < 0.05$ vs. women without PPD.

mother-in-law and daughter-in-law, fetus gender were risk factors of PPD, while housing condition was negatively correlated with the incidence of PPD with OR value of 0.82.

3.4. Social support in delivery women

The scores of social support in delivery women with PPD were showed in Table 3. Compared with delivery women without PPD, the total score of social support rating scale, the score of objective support, subjective support and social utilization degree were significantly reduced in women with PPD.

4. Discussion

Our study showed that PPD was common among the residents of Tangxia Community, Guangzhou with a total incidence of 27.37%. 14.04% of our participants suffered mild PPD and 11.63% suffered moderate PPD in the first four weeks postpartum. Our result is consistent with reports in Asian countries which indicated the prevalence of PPD ranged from 3.5% to 63.3%^[5]. However, we found lower rates of depression in postpartum mothers in Mainland China as observed in other studies. A study conducted by Rinat Armony-Sivan revealed the proportion of women with PPD in Hebei province of Northern China at 6 weeks was 20.3%^[24]. An epidemiological survey on 342 Chinese women at 6 to 8 weeks postpartum reported a prevalence of 15.5%^[25]. Differences across measurement tools, environmental and cultural norms may account for the higher rate of PPD in the present study. Firstly, despite Edinburgh Postpartum Depression Scale was used in a majority of studies to measure PPD, the cut-off points differed across countries which in our study a score of 10 was applied. Secondly, the difference of the time periods used in the research of PPD may have great influence on the prevalence of PPD. Generally speaking, the rates obtained later in postpartum (eg. at 4 to 6 weeks) are higher than those conducted closer to delivery (eg. at 1 week)^[26]. Thirdly, divergent environmental and cultural context may be taken into account when explain the higher rate in our survey. We conducted the research between May to September when it was very hot and humid in Southern China. Seasonal affective disorder, a life time prevalence of 0% to 9.7% in general population including a depressed mood, decreased activity, increased sleep duration, weight gain and changed appetite may enhance the probability of PPD in delivery women^[27]. Furthermore, we have noticed that rapid industrialization have brought about changes in the demographic structure, cultural identity, moral values and housing condition in China in the past decades. As Chinese societies are steadily urbanized in the process of transformation, it is possible that the rate of

mental disorders like PPD in Chinese society will be found closer to those observed in Western society.

Tangxia Community is just the miniature of Chinese urbanization where some traditional conceptions were invaded by modern mindset. Therefore, originally recognized protective factors such as nuclear family may no longer work which resulted in the increased rates of PPD in our study.

The development of PPD is associated with a list of factors including biology, psychology, sociology and genetics^[28]. It's noteworthy that socio-cultural background play an important part in the occurrence of PPD^[29]. Due to the implementation of family planning policy since 1980s in China, the number of women in childbearing age who lived in one-child family is increasing. There has been much attention on mental health of such a high-profile population because they are the first generation of only child who have undergone unprecedented social transformation their parents never did. In addition, relationship between mother-in-law and daughter-in-law, fetus gender, housing condition, characteristics of distinct traditional Chinese culture and regional culture may also impact the development of PPD. Therefore, in our study, we selected the above-mentioned factors along with biological and demographic features in order to distinguish risk factors correlated with PPD in Tangxia Community, Guangzhou.

Our study adds a new dimension to the development of PPD as we have found delivery women from one-child family have a significantly higher risk of PPD with OR value of 1.421 ($P=0.011$). Few studies have been reported about its effect on PPD. Possible explanation may include two scenarios, one is they are not accustomed to the role transition as a majority of delivery women are first-time mothers. The other is that this group of women, coddled by their parents and relatives since toddlerhood, is more vulnerable to low spirit, anxiety and eventually depression when the family attention has been focused on the baby,

Previous studies in different regions of China have shown significant associations of PPD with mother and daughter-in-law relationship^[29,30]. Our research indicated that the rate of PPD was significantly lower in women with a harmonious mother and daughter-in-law relationship compared with those when conflicts often occurred. Our finding is in agreement with these observations. Yet, few studies have explored the effect of mother and daughter-in-law collision on women postpartum in English literature. This may partly due to the couple's living apart with their parents in Western society. Disharmony between mother and daughter-in-law is one of the most common conflicts in China and other Asian countries where couples usually live with their parents. Due to the fact that this relationship has nothing to do with blood nor the marital relations, conflict is arisen when each struggle to achieve the same position in the family as the dominant woman.

Our findings revealed that a female fetus and a small area

of housing were significant contributors for PPD in mothers. Mothers delivering a female fetus are more likely to be affected with PPD in contrast with mothers with a male fetus. Our results is similar with the observations of Gao *et al* among first-time mothers in mainland China despite studies conducted in Western society did not report a correlation between fetus gender and PPD^[31,32]. We have to declare that all participants don't know the gender of fetus before delivery since prenatal fetus gender identification is illegal and doctors who do not abide by the legal provision will face criminal charges and suspension of medical license in China. We speculate the dissatisfaction of family members toward the birth of female baby is a heavy burden for the mother psychologically. Preference for boys over girls is common in China particularly at regions deeply influenced by south of the Five Ridges culture like the community in our study. Lack of complete social security system and a traditional notion that only boys can continue the family lineage may partially explain this phenomenon. Moreover, the significant negative association that we observed between lower area of housing and PPD was likely to be ascribed to the exacerbation of housing condition followed by the arrival of the baby. The community we surveyed is one of the areas with highest density of population in Southern China. The high cost of living along with unaffordable housing is increasing concerns about the development of child in mothers.

In our study, the effect of biological factors such as parity, delivery mode, pregnancy associated diseases, delivery related disease and newborn disease on the development of PPD was also examined. Our research demonstrated caesarean section is a significant contributor for distress in delivery women. Conversely, a prospective study in Iran conducted by Sadat *et al.* failed to reveal a correlation between mode of delivery and PPD though women with vaginal delivery had greater decrease in EPDS score from 2 to 4 months^[33]. Another study on women dwelling in Beirut, Lebanon recognized Caesarean section as a stronger protective factor against PPD^[34]. Our result should be read in cultural context of China. Because primary schools often begin at September, a growing number of women reject natural childbirth even though the biological indication for surgery is lacking in order to go to school a year earlier and have a better start in life for the children. On the other hand, this same group of women tends to perceive caesarean section as a source of fear, stress and traumatic experience.

In our sample, no relationship was found between age, marital status, occupation, education and household income with PPD. At present, results are variant with these findings but consistent with the reports of a positive correlation between lower levels of income and PPD conducted in Taiwan, Iran and United Kingdom^[2,35–37]. However, our finding of no relationship between lower income and PPD

may ascribe to the fact that women dwelling in Tangxia Community, Guangzhou have a higher socio-economic status and better paid.

Social support may play an important role in the occurrence of PPD as observed in previous studies. Social support, including social networks, social cohesion and social services provides a buffer for women postpartum as they try to balance career identity and motherhood^[38,39]. In our study, the total score of social support rating scale, the score of objective support, subjective support and social utilization degree were significantly reduced in women with PPD in contrast with psychologically healthy women. The lower degree of social support highlights the need to perfect social welfare system for depressive women postpartum.

The limitation of the study is that a self-report rating scale was used to determine PPD rather than a clinician-administered structured diagnostic interview. Moreover, the risk factors of PPD in this community may not be similar to those observed in a larger population. The role of some age-old rituals in China like “do the month” in the development of PPD also needs further study.

In conclusion, prevalence of PPD in Tangxia Community is slightly higher than the corresponding rate of other communities in China which could in part due to differences of regional culture. It's of great importance that health-care professionals become aware of PPD and develop health promotion program in order to enhance the well-being of delivery women.

Conflict of interest statement

We declare we have no conflict of interest.

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