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Family functioning and 1-year prognosis of first-episode major depressive disorder

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ABSTRACT

This study aims at investigating the characteristics of family functioning in Chinese first-episode major depressive disorder (FE-MDD) patients and its relationship with major depressive episode (MDE) duration. We recruited 63 FE-MDD families and 59 healthy comparison (HC) families from WuHan Mental Health Center and its nearby communities from September 2014 to August 2016. Family functioning was assessed by the Chinese version of Family Assessment Device (FAD). After baseline assessment, MDD patients were followed-up monthly for one year. Independent t test and Pearson correlation analysis were respectively used to compare the family functioning of MDD and HC families and to assess the relationship between family functioning and MDE duration. Our results showed that MDD families exhibited family impairment in all the 7 sub-scales of FAD. MDD patients with "healthy family functioning" showed significantly shorter MDE duration than those with "unhealthy family functioning". MDE duration was positively correlated with the score of problem solving (PS), communication (CM) and general functioning (GF) subscales. These findings indicate that Chinese MDD families are associated with a wide range of family impairments and family functioning is linked to the MDE duration. Improvement of family functioning may be helpful for the recovery of MDD.

1. Introduction

Major depressive disorder (MDD) is a psychiatric disorder highly prevalent and imposing high disease burden. More than 350 million people worldwide have suffered from it and the disease burden it will impose is predicted to be second highest of all the physical and psychiatric illnesses by 2020 (World Health Organization, 2016). Families with a depressed member are being repeatedly reported to suffer from decreased family functioning in a wide range of domains, including problem solving, communication, family roles, etc (Keitner and Miller, 1990; Weinstock et al., 2006). The impairment of depressed families' family functioning even persists after the patients' recovery (Weinstock et al., 2006), which indicates that the decreased family functioning is not only a response to acute depression, but also a potential trait of depressed patients.

However, only a very few studies, with inconsistent findings, had ever explored the role of family functioning in the prognosis of depression. Keitner et al. (1987) reported that improvement of family functioning during treatment was associated with the remission of depression, while the family functioning in acute depression was not an effective predictor of MDE duration during a 1-year follow-up. In contrast, Feeny et al. (2009) found that healthy family functioning was associated with higher remission rate of depression within 12 weeks' treatment. As for the effect of family functioning on the relapse of depression, Vaughn and Leff (1976) found that depressed patients with high-level emotion expression family environment exhibited a risk of relapse 3 times higher than those with low-level emotion expression family environment. Nevertheless, Goering et al. (1983) reported no significant difference in depression relapse rate between patients with high emotion-expression family members and those with low emotion-expression family members. The inconsistency of findings in the above studies may be attributed to sample heterogeneity. Specifically, the prognosis of MDD is thought to be closely associated with the history, episodes and severity of depression, yet these factors have been rarely controlled in the above studies.

In addition, family functioning is closely linked to sociocultural norms (David, 1978; Kazarian, 2010). There are a number of interesting and significant differences between families in the East and those in the West. For example, parents in Oriental culture tend to be more authoritarian to their children than those in Western culture (Cheah et al., 2013; Chien, 2016). Moreover, family members (especially male members) are less likely to express their emotion in Oriental culture

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(Zhu et al., 2013). These culture-related features are closely related with such important aspects of family functioning as family role, communication, affective involvement, behavior control, etc. Nevertheless, currently most studies on family functioning of MDD are using samples from Western countries. A scant studies investigating the characteristics of family functioning of Chinese MDD families recruit samples from big cities, like Hongkong (Kwok and Shek, 2009) and Shanghai (Wang et al., 2013; Wang and Zhao, 2012, 2013) in the Southern or Eastern coastal China, where Western culture has long played a strong influence. In this context, studies recruiting samples from mainland China wherein with lighter Western influence are needed.

This study investigates the characteristics of family functioning and its relationship with MDE duration and remission rate according to a Chinese first-episode MDD sample in Wuhan, an inland city in the central part of mainland China. Our goal was to delineate the characteristics of family functioning of MDD from a background of Chinese traditional culture. Another goal was to investigate the effect of family functioning on MDE duration and remission rate in Chinese MDD patients. Based on the findings from the samples of Western culture (Keitner et al., 1987), we hypothesized that the family functioning of MDD patients' family in Chinese culture would also demonstrate a wide range of impairments, and the family functioning would be related to the MDE duration.

2. Methods

2.1. Participants

First-episode MDD patients and one of their family members were recruited from the outpatient and inpatient departments of Wuhan Mental Health Center (WMHC) from September 01, 2014 to August 31, 2016. The inclusion criteria for MDD patients were: (1) meeting the criteria of International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) major depressive disorder (MDD), single episode (F32); (2) ≤6 months since onset of depression; (3) 24-item Hamilton Depression Rating Scale ($HAMD_{24}$) ≥ 20; (4) aged 18-55 year; (5) education ≥6 year; (6) no history of drug/alcohol abuse/dependence; (7) no current suicidal ideation; (8) no cohabitating family member with major medical or psychiatric illness; (9) informed consent of the patient and one of their healthy cohabitating family members.

Healthy comparisons (HCs) and their family members were recruited from communities nearby WMHC by means of flyers, online advertisement, and referral of WMHC staffs. Eligible HCs for inclusion shall be in the condition that none of them or their cohabitating family members meet the criteria of ICD-10 psychiatric disorder or major medical condition. The HC group was roughly matched with the MDD group according to their age, sex, education, family role and marital status. Participants were excluded if they: (1) were comorbid with other psychiatric disorders or major medical condition; (2) were women on pregnancy or breeding; (3) had received treatment for thyroid or cortisol medications in the latest 3 months; (4) switched to mania during the follow-up. This study has been approved by the Ethics Committee of Wuhan Health and Family Planning Commission. All the research procedures used in this study are in accordance with the Declaration of Helsinki.

2.2. Assessment of family functioning

The Family Assessment Device (FAD, Chinese version) (Liu and He, 1999) was used to assess the family functioning of MDD patients, HCs and one of their family members aged ≥12 year. The FAD includes 7 sub-scales: problem solving (PS, ability of solving problems to sustain family functioning), communication (CM, exchanging information with each other among family members), roles (RL, assigning responsibilities among family members to attain family functions), affective responsiveness (AR, ability of responding to other family members with authentic feelings), affective involvement (AI, being emotionally interested in each other), behavior control (BC, family rules adopted to deal with dangerous situations and/or meet the biological, psychological and interpersonal needs) and general functioning (GF). Higher scores of FAD sub-scales indicate poorer family functioning. The validity and reliability of FAD in Chinese population has been confirmed (Liu and He, 1999; Shek, 2012). As reported in previous studies, the assessment of family functioning of a family among different family members is moderately-to-highly consistent (Li, 2013; Wang et al., 2013). Thus, to account for the difference of perceived family functioning between family members, we adopted the mean FAD and sub-scale scores of two family members as the score of family functioning in this study.

2.3. Definition of MDE duration

At baseline, all MDD patients, HCs and one of their family members were assessed with FAD for family functioning and with 24-item Hamilton Depression Rating Scale ($HAMD_{24}$) for depression. In the following year after that, each patient was followed up and assessed with $HAMD_{24}$ at the end of every month by online or face-to-face interview. Clinical remission was defined as $HAMD_{24} \leq 7$ for at least 2 consecutive months at the end of follow-up. Despite the ongoing of the study, the medication, physical and psychological treatments of the patients were not affected by the study, instead, determined by the attending psychiatrists.

2.4. Statistical analysis

Independent t tests were used to compare the difference between MDD and HC in demographic variables and family functioning. The association between family functioning and MDE duration was analyzed by means of Pearson correlation analysis. Chi-square analysis was used for the categorical variables. All statistical analyses were done in SPSS 24.0. A two-tailed $p < 0.05$ was selected as statistical significance.

3. Results

3.1. Demographic characteristics of the MDD and the control groups

Seventy-six MDD families and 59 HC families were eligible and consented to participate in this study. Thirteen MDD families were excluded in the data analysis for the following reasons: lost to follow-up ($n = 5$), switching to mania ($n = 3$), at least 1 cohabiting family member with a major medical condition during follow-up ($n = 5$, 2 acute coronary artery disease, 2 stroke, 1 cancer). Thus, 63 MDD families and 59 HC families were finally included in the data analysis. No significant difference was detected in age, gender, education, family role and marital status between the MDD group and HC group (Table 1).

3.2. Family functioning of MDD in acute MDE

At baseline, MDD families showed impaired family functioning in all the 7 sub-scales of FAD (Table 2). Interestingly, the HC families also demonstrated elevated scores in AI and BC (Table 2). Based on the cut-offs recommended by Miller et al. (1985), each family was categorized as either "healthy" or "unhealthy" in each of the 7 family functioning domains. The proportion of "unhealthy families" in MDD families was significantly higher than that in the HC families in all the seven FAD sub-scales except for AI and BC (Table 2).

Table 1
Demographic information of MDD patients and HCs.

	MDD (n = 63)	HC (n = 59)	t or χ^2	p
Age (yr)	42.34 ± 12.67	39.83 ± 11.27	1.15*	0.25
Sex (M/F)	24/39	18/41	0.77#	0.38
Education (yr)	10.73 ± 7.26	12.55 ± 8.57	1.26*	0.21
Role (husband/wife/child)	16/32/15	14/33/12	0.35#	0.84
Marital status (both spouses firstly married / recombined family / separated, divorced, or widowed)	38/12/13	35/14/10	0.54#	0.76

MDD: major depressive disorder; HC: healthy comparison; yr: year
* : t value
# : χ^2

3.3. Relationship between family functioning and MDE duration and clinical remission rate

According to the recommendation of Akister and Stevenson-Hinde (1991), MDD families were categorized into two groups: "MDD with healthy family functioning" and "MDD with unhealthy family functioning". The "MDD with unhealthy functioning" was defined as families showing scores higher than the cut-offs in at least four dimensions of FAD sub-scales. In contrast, the "MDD with healthy functioning" was defined as families with scores higher than the cut-offs in 3 or less dimensions of FAD sub-scales. According to this criterion, 60.3% (n = 38) of MDD families were categorized as "MDD with unhealthy functioning". The baseline depression severity was not significantly different between patients with "healthy family functioning" and patients with "unhealthy family functioning" (Table 3). Patients with "unhealthy family functioning" showed longer duration of MDE than patients with "healthy family functioning" ($p < 0.05$, Table 3). Slightly higher remission rate was detected in patients with "healthy family functioning" than that in patients with "unhealthy family functioning", although this difference didn't achieve statistical significance ($p = 0.08$, Table 3). In addition, unremitted patients were associated with higher scores in PS, CM and GF in acute depression (Table 4). The Pearson correlation analyses also revealed a positive correlation between PS, CM and GF scores and MDE duration (Table 5). However, no significant correlation was detected between RL, AR, AI, BC and MDE duration.

4. Discussion

Our study is the first to investigate the characteristics of family functioning and its relationship with the prognosis of depression in Chinese first-episode MDD patients. Currently most of the studies investigating the family functioning of depressed patients recruited samples from Western countries or cities deeply influenced by Western culture, the selection of a depressed sample from a typical inner mainland city in China supplemented valuable information about the effect of culture on this issue. The results of our study demonstrated there are various types of impairments of family functioning among Chinese depressed patients. The results also showed there are impairments of family functioning in AI and BC in Chinese healthy families. Furthermore, the results also revealed significant correlations between family functioning in acute depression and MDE duration, indicating that family functioning could serve as a predictor of first-episode MDD prognosis.

4.1. Characteristics of family functioning in Chinese MDD families

Despite the short duration of depression history (≤6 months), the MDD families in our study showed significant impairment in all family functioning domains measured by FAD. This is consistent with the findings of a previous study which recruited a depressed sample from Western culture (Keitner et al., 1987), suggesting trans-culture consistency of family functioning impairments among depressed patients. In addition, even in the early phase of depression, family functioning impairment was remarkable, which was consistent with previous findings of family functioning impairments in adolescents with high-risk of depression (Tamplin and Gooyer, 2001). Taken together, our study supported a wide-range impairment in family functioning in early-phase MDD patients. However, due to the correlational nature of the data, we are unable to know whether the impaired family functioning is a risk factor of MDD or a consequence caused by depressive episode. Future studies with longitudinal assessment of the trajectory of family functioning and depression are needed to address this question.

Interestingly, no significant difference was detected between MDD and HC families in AI and BC sub-scales of FAD. This may be linked to the elevated scores of AI and BC sub-scales in HC families in our study. It has been reported that due to cultural difference, Chinese healthy families also exhibit elevated scores in AI and BC sub-scales of FAD (Wang and Zhao, 2012). Traditional Chinese culture stresses on hierarchy within a family and a society, under which people are requested to control their behaviors to meet Confucian doctrines, thereby tending to suppress natural impulses and verbal expression of emotions. Thus, the lack of affective involvement and the overstress of behavior control may be considered as features of traditional Chinese families, even in "healthy" families.

4.2. Relationship between the family functioning and the prognosis of MDE

It is of significant clinical meaning to find whether healthy family functioning and good prognosis of MDE are related. In our study, the MDE duration was remarkably shorter in MDD with healthy family functioning than that with unhealthy family functioning. Although the proportions of remitters in two MDD sub-groups didn't differ significantly, there was a trend towards higher proportion of remitters in MDD with healthy family functioning ($p = 0.08$). Besides, the remitters had a better family functioning in acute depression than unremitters, and the scores of PS, CM and GF were positively correlated with the MDE duration. However, these findings are inconsistent with a previous

Table 2
FAD scores and proportion of unhealthy families in MDD and HC group.

	MDD group	HC group	p	McMaster cut-off	Unhealthy families in MDD group	Unhealthy families in HC group	χ^2	p
PS	2.52 ± 0.82	1.92 ± 0.73	<0.01	2.2	44 (69.8%)	18 (30.2%)	18.86	<0.01
CM	2.47 ± 0.74	1.87 ± 0.76	<0.01	2.2	46 (73.0%)	20 (33.9%)	18.77	<0.01
RL	2.39 ± 0.63	2.08 ± 0.57	<0.01	2.3	33 (52.4%)	16 (27.1%)	8.09	<0.01
AR	2.49 ± 0.72	1.96 ± 0.64	<0.01	2.1	39 (61.9%)	19 (32.2%)	10.78	<0.01
AI	2.57 ± 0.94	2.39 ± 0.77	0.25	2.2	51 (80.9%)	43 (72.9%)	1.12	0.29
BC	2.45 ± 0.83	2.32 ± 0.71	0.36	1.9	52 (57.1%)	42 (71.1%)	2.22	0.14
GF	2.33 ± 0.79	1.87 ± 0.72	<0.01	2.0	43 (68.3%)	20 (33.9%)	14.40	<0.01

MDD: major depressive disorder; HC: healthy comparison; FAD: family assessment device; PS: problem solving; CM: communication; RL: roles; AR: affective responsiveness; AI: affective involvement; BC: behavior control; GF: general functioning

Table 3
Comparison of MDE duration and 6-month remission rate between MDD patients with "healthy family functioning" and patients with "unhealthy family functioning".

	Patients with healthy family functioning (n = 38)	Patients with unhealthy functioning (n = 25)	t or χ^2	p
Baseline $HAMD_{24}$	32.6 ± 8.1	30.8 ± 6.9	0.93*	0.37
Duration of MDE (M)	6.24 ± 2.32	7.56 ± 2.08	2.30*	<0.05 (0.025)
1-year remitters (%)	28 (76.3%)	13 (52.0%)	3.12#	0.08

MDE: major depressive episode; MDD: major depressive disorder; $HAMD_{24}$: 24-item Hamilton Depression Rating Scale;
* : t value
# : χ^2

Table 4
Comparison of family functioning in acute depression in remitted and unremitted MDD patients.

	Remitted (n = 41)	Unremitted (n = 22)	t	p
PS	2.36 ± 0.68	2.81 ± 0.83	2.32	<0.05 (0.024)
CM	2.23 ± 0.73	2.72 ± 0.76	2.50	<0.05 (0.015)
RL	2.30 ± 0.56	2.54 ± 0.62	1.56	0.12
AR	2.42 ± 0.73	2.66 ± 0.85	1.17	0.25
AI	2.49 ± 0.78	2.70 ± 0.83	1.00	0.32
BC	2.38 ± 0.58	2.57 ± 0.76	1.11	0.27
GF	2.19 ± 0.63	2.64 ± 0.82	2.43	<0.05 (0.018)

PS: problem solving; CM: communication; RL: roles; AR: affective responsiveness; AI: affective involvement; BC: behavior control; GF: general functioning

Table 5
Pearson correlation analysis of family functioning and MDE duration.

FAD sub-scales	r	p
PS	0.47	< 0.05 (0.021)
CM	0.52	< 0.05 (0.013)
RL	0.32	0.09
AR	0.25	0.22
AI	0.29	0.18
BC	0.19	0.11
GF	0.44	< 0.05 (0.019)

PS: problem solving; CM: communication; RL: roles; AR: affective responsiveness; AI: affective involvement; BC: behavior control; GF: general functioning; r: Pearson correlation coefficient

study showing that family functioning in acute depression was not linked to the MDE duration (Keitner et al., 1987). The inconsistency might result from the heterogeneity of samples' characteristics. In our study, the sample was first-episode, moderate to severe MDD with duration ≤6 months, while in the study of Keitner et al. (1987), there was no limitation on the episodes, severity and depression history of the subjects. As reported in previous studies, the episodes (Richards, 2011), severity (Melartin et al., 2004; Stegenga et al., 2012) and history (Colman et al., 2011) were closely linked to MDE duration and might act as confounders for the effect of family functioning on MDE prognosis. Thus, the inconsistency between our study and Keitner et al. (1987) might be due to the lack of controlling these factors in Keitner et al. In spite of that, future studies are needed to replicate or reproduce the findings so as to achieve a robust conclusion of this issue.

4.3. Limitations

Coexistent with the advantages discussed above, there are some limitations of the study. First, although we have controlled the effect of episodes, depression history and severity on the prognosis of MDD in this study, there are some other factors that may exert influence on the prognosis of depression, like medication, childhood trauma etc. These factors are not controlled in this study. Future studies controlling these factors would be helpful to achieve robust conclusions. Second, the norms of FAD scale are based on samples recruited from Western culture, which are different from that of Oriental culture. New scales with consideration of Chinese culture norms are necessary. Third, although FAD is one of the most commonly used assessing tools for family functioning assessment, it is not specific to families with MDD patients. Future studies using depression-specific scales, like Depression and Family Functioning Scale (DFFS) (Di Benedetti et al., 2012) would be valuable supplementations for addressing this topic. Fourth, the family functioning of patients was only assessed at baseline, and no information was available about the change of family functioning with time. Future studies assessing the relationship between changes of family functioning and prognosis of MDE would be helpful for further clarification of the association between family functioning and depression.

4.4. Conclusions

Despite the above limitations, this study represents the first longitudinal study investigating the effect of family functioning on the prognosis of depression in a Chinese first-episode MDD sample. Like what has been found in MDD patients of Western countries, Chinese first-episode MDD patients are also associated with a wide range of impairments in family functioning. Healthy family functioning in acute depression is linked to shorter MDE duration in 1-year follow-up. Among all the FAD sub-scales, PS, CM and GF are the most closely related to MDE duration. Our findings supported the significance of family functioning in predicting the prognosis of MDD and provided a theoretical basis for interventions targeting at improving family functioning for MDD patients. Future studies assessing the effect of family-based psychosocial interventions for the treatment and prevention of MDD are worth anticipating.

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Conflict of interest disclosure

The authors declare no conflict of interest.

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