Family dynamics in families with children with Attention Deficit Hyperactivity Disorder

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Background: Development of adjunctive family therapy for the treatment of children with Attention Deficit Hyperactivity Disorder (ADHD) in China requires a detailed understanding of the family dynamics of these families.

Aim: Assess the family dynamics of families with children who have ADHD in Nanjing, China.

Methods: Forty-six children 10 to 17 years of age treated at the Nanjing Brain Hospital for ADHD and 46 control children of the same age and gender from schools in Nanjing completed the 19-item Questionnaire of Systematic Family Dynamics (QSFD) which assesses four dimensions of family functioning: Family Atmosphere, Individuation, Moral Absolutism, and Personal Responsibility for Psychological Problems.

Results: There were no differences between groups in the perceived causes of psychological problems but the ADHD children reported a poorer family atmosphere, less independence from parents, and more ambiguity about ‘right’ and ‘wrong’ in the family. After adjustment for the potential confounding effects of parental education and family economic status, the findings of poorer family atmosphere and less individuation in the ADHD children remained statistically significant. The internal consistency of the four dimensions of the QSFD as completed by the children were poor (alpha=0.44-0.53).

Conclusion: This preliminary study on the family dynamics of families with children that have ADHD finds that the ADHD children report a poor family atmosphere and little independence from parents. Further work is needed to validate the methods for assessing family dynamics in Chinese families, particularly when using children as informants, but this method provides valuable information that could be used as the focus of adjunctive family therapy to augment the traditional pharmacological and behavioral approaches to the treatment of ADHD.

1. Introduction

Kuisma and colleagues[1] defined the family as an interactive system that is regulated by ‘family dynamics’. The study of family dynamics focuses on the internal psychological processes, behaviors and methods of communication that underpin the relationships between family members, and between the family unit and the outside world.[2] Systematic Family Therapy, a branch of family therapy that has developed over the past 40 years, is grounded in the theory of family dynamics.[3]

Attention Deficit Hyperactivity Disorder (ADHD) is a common behavioral disorder among children with a prevalence of 5 to 8%.[4] The main clinical symptoms include difficulty concentrating, hyperactivity, and impulsiveness. If not treated, over time the symptoms have negative effects on academic performance and social functioning. The cause of ADHD remains unknown but it is associated with introversion and emotional instability, and the families of these children tend to have low intimacy, decreased emotional expressiveness, few intellectual interests, high conflict and excessive controls on the children’s behavior.[5]

The treatment of ADHD usually combines medication and behavioral therapy. Recent reports in China on the effectiveness of adjunctive Systematic Family Therapy in ADHD has stimulated interest in this modality.[6] But the appropriate application of family-based interventions for ADHD requires a detailed, culture-specific understanding of the family dynamics of families with children that have ADHD. Several studies report that the characteristics of the families of patients with different types of mental disorders are different,[7-8] but to our knowledge no study in China has assessed the family dynamics of families with children with ADHD.

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The current study compares the family dynamics of families with and without children with ADHD in Nanjing, China. In this paper ‘family dynamics’ refers to the behavior and communication within the family, and the relationship of the family unit to the outside world.

2. Methods

2.1 Subjects

The method of identifying cases and controls is shown in Figure 1. All cases were outpatients at the Child Mental Health Research Center of Nanjing Brain Hospital from January to December 2010, who had been diagnosed with ADHD by two experienced psychiatrists according to the criteria specified in the Chinese Classification of Mental Disorders (CCMD-3).[10] Children with co-morbid developmental disorders, emotional disorders, tic disorders or conduct disorders and those who had not yet entered the third grade of primary school were excluded. A total of 46 qualified cases participated and successfully completed the study survey. Their mean (sd) age was 11.9 (1.8) years; 41 were boys and 5 were girls; the duration of illness ranged from 3 to 6 years; and their main clinical symptoms were hyperactivity, impulsiveness and attention deficit.

Healthy control subjects were selected from one elementary school and one middle school in Nanjing randomly selected from all schools in Nanjing that participated in a national study on families and children. Stratified sampling methods were used to identify 120 children, who had average or above average academic performance and who were 10 to 17 years of age, from eight classrooms at the two schools. Among the 120 children, 17 were unwilling to participate in the survey and 20 only partially completed the survey questionnaire. The remaining 83 completed the survey. The number of ADHD cases in each of the 16 gender-age groups (i.e., 10-year-old boys, 10-year-old girls, ..., 17-year-old boys, 17-year-old girls) in the patient group were then randomly selected from the corresponding gender-age group in the 83 students who completed the survey. This resulted in 46 controls with the same gender and age distribution as the cases, including 41 boys and 5 girls with a mean age of 11.9 (1.7) years.

All participating students and their parents signed written consent forms to participate in the study.

2.2 Survey

The children and both parents of all cases and controls separately completed the main survey instrument — the Questionnaire of Systemic Family Dynamics (QSFH)[3]— but only the results for the children are presented in the current report. The patient group respondents completed the survey in the outpatient clinic; control group respondents completed the survey at the children’s schools. Participants were instructed by three trained researchers in the completion of the survey.
survey instrument. The researchers then observed the participants while they completed the survey (which took about 10 minutes) and were available to clarify any questions the respondents did not understand. Basic demographic information on the age and gender of the child, and on the level of parental education and family income were obtained from participants’ mothers.

2.3 The Questionnaire of Systemic Family Dynamics (QSFD)

Developed by Yang and colleagues,[3] the QSFD includes 29 items scored on 1-5 point Likert scales that are subdivided into four dimensions: good vs. bad family atmosphere (11 items), individuation vs. symbiosis of family members (8 items), moral absolutism vs. moral relativism of family members (6 items), and perceived responsibility (self vs. others) for psychological problems (4 items). The Family Atmosphere dimension assesses the degree to which the household is relaxed, cheerful and non-authoritarian; the Individuation-Symbiosis dimension assesses the extent to which family members are independent of each other; the Absolutism-Relativism dimension assesses the degree to which family members see the world in terms of ‘black’ and ‘white’ and in terms of ‘right’ and ‘wrong’; and the Responsibility for Psychological Problems dimension assesses the extent to which respondents think psychological illnesses are caused by personal and family problems.[11] Based on earlier research on the questionnaire, the internal consistency of the 29 items in the QSFD using Cronbach’s α is 0.81, and the α of the four dimensions are 0.67-0.87. The test-retest reliability of the overall scale (using Pearson’s correlation coefficient) is 0.89 and that for the four dimension scores range from 0.74-0.92.[3]

2.4 Statistical methods

The data were analyzed using SPSS 19.0. Chi-squared tests and Mann-Whitney rank tests were used to compare characteristics of cases and controls. The QSFD scores of cases and controls were compared using t-tests. The relationship of the QSFD total score and dimension scores to parental education and family economic status were assessed using Spearman ranked correlation coefficients. Linear regression models using the total QSFD score and, separately, each of the four QSFD dimension scales as the dependent variables assessed the relationship of ADHD to family dynamics after adjusting for the effects of parental education and family income level.

This study was approved by the Ethical Review Board of the Nanjing Brain Hospital.

3. Results

As shown in Table 1, there were no significant differences in the characteristics of patients’ and controls’ families. The majority were nuclear families.

| Variables | All subjects (n=92) | Case group (n=46) | Control group (n=46) | statistic | p-value |
|-----------|---------------------|-------------------|----------------------|-----------|---------|
| Nuclear family (i.e., two parents and children) | 63 (68.5%) | 30 (65.2%) | 33 (71.7%) | χ²=0.45 | 0.501 |
| Only child | 77 (83.7%) | 39 (84.8%) | 38 (82.6%) | χ²=0.08 | 0.778 |

**Education level of father**

| Education level of father | All subjects | Case group | Control group | statistic | p-value |
|---------------------------|--------------|------------|--------------|-----------|---------|
| Elementary school or lower | 2 (2.2%) | 0 (0%) | 2 (4.3%) | Z= -0.96 | 0.336 |
| Middle school | 18 (19.6%) | 8 (17.4%) | 10 (21.7%) | Z= -0.31 | 0.754 |
| High school | 33 (35.9%) | 17 (37.0%) | 16 (34.8%) | | |
| College or higher | 39 (42.4%) | 21 (45.7%) | 18 (39.1%) | | |

**Education level of mother**

| Education level of mother | All subjects | Case group | Control group | statistic | p-value |
|----------------------------|--------------|------------|--------------|-----------|---------|
| Elementary school or lower | 4 (4.3%) | 3 (6.5%) | 1 (2.2%) | Z= -0.31 | 0.754 |
| Middle school | 23 (25%) | 9 (19.6%) | 14 (30.4%) | Z= -0.63 | 0.529 |
| High school | 31 (33.7%) | 19 (41.3%) | 12 (26.1%) | | |
| College or higher | 34 (37.0%) | 15 (32.6%) | 19 (41.3%) | | |

**Family monthly income (RMB)**

| Family monthly income (RMB) | All subjects | Case group | Control group | statistic | p-value |
|-----------------------------|--------------|------------|--------------|-----------|---------|
| Less than 3,000 | 19 (20.7%) | 8 (17.4%) | 11 (23.9%) | | |
| 3,000-5,000 | 37 (40.2%) | 22 (47.8%) | 15 (32.6%) | Z= -0.63 | 0.529 |
| 5,000-10,000 | 19 (20.7%) | 11 (23.9%) | 8 (17.4%) | | |
| More than 10,000 | 17 (18.5%) | 5 (10.9%) | 12 (26.1%) | | |

*Z-value from Mann-Whitney test
bIn 2010 the mean conversion rate for RMB to $US was 6.8 RMB=1 $US
in which the subject was the only child. About 40% of the children’s fathers and 35% of their mothers had a university education. The majority of families had monthly incomes of 3000 to 10 000 Renminbi per month ($440-$1470 in $US), placing them in China’s urban middle class.

Table 2 shows that the internal consistency of the overall QFSD score in this sample was satisfactory (alpha >0.60), but the internal consistency for the four dimension scores were poor (alpha between 0.40 and 0.60). The total score and three of the dimensional scores of the QFSD were significantly higher in the case group than in the control group. Compared to the healthy control children, the ADHD children reported a poorer family atmosphere, less individuation of family members, and a more morally relativistic approach to problem solving in the family.

As shown in Table 3, parental education level and family economic level were not related to the various measures of family functioning. The one exception was that children of mothers with higher levels of education were more likely to report more morally rigid attitudes in family members.

The results of the linear regression analyses are shown in Table 4. After adjusting for the potential effects of parental education, maternal education and the economic level of the family, children with ADHD reported a poorer family atmosphere and less individuation of family members than control children. There were, however, no statistically significant differences between groups in the absolutism vs. relativism dimension or in the responsibility for psychological problems dimension.

### Table 2. Comparison of different dimensions of family dynamics between case group and control group

| Dimensions                      | number of items | alpha (n=92) | Case group (n=46) mean (sd) | Control group (n=46) mean (sd) | t-value | p-value |
|---------------------------------|-----------------|--------------|----------------------------|--------------------------------|---------|---------|
| Good Family Atmosphere vs. Bad Family Atmosphere | 11              | 0.44         | 28.8 (9.0)                 | 22.2 (7.9)                     | 3.74    | <0.001  |
| Individuation vs. Symbiosis     | 8               | 0.46         | 24.0 (5.6)                 | 20.6 (6.5)                     | 2.74    | 0.008   |
| Moral Absolutism vs. Moral Relativism | 6              | 0.53         | 16.7 (3.8)                 | 14.9 (4.7)                     | 2.02    | 0.047   |
| Personal Responsibility vs. Other Causes for Psychological Problems | 4               | 0.53         | 12.4 (3.0)                 | 11.7 (3.6)                     | 0.98    | 0.330   |
| TOTAL SCORE                     | 29              | 0.63         | 81.9 (14.5)                | 69.4 (16.8)                    | 3.82    | <0.001  |

### Table 3. Spearman rank correlation test of QFSD total and dimension scores (n=92)

| Dimensions                      | Education level of father | | Education level of mother | | Family income | r | p-value |
|---------------------------------|----------------------------|---|---------------------------|---|---------------|---|---------|
| Good Family Atmosphere vs. Bad Family Atmosphere | -0.08 | 0.454 | -0.14 | 0.196 | -0.15 | 0.152 |
| Individuation vs. Symbiosis     | 0.11 | 0.284 | -0.02 | 0.843 | 0.10 | 0.350 |
| Moral Absolutism vs. Moral Relativism | -0.15 | 0.151 | -0.27 | **0.009** | -0.13 | 0.232 |
| Personal Responsibility vs. Other Causes for Psychological Problems | -0.05 | 0.667 | -0.07 | 0.521 | -0.05 | 0.673 |
| TOTAL SCORE                     | -0.02 | 0.882 | -0.12 | 0.239 | -0.06 | 0.605 |

QFSD, Questionnaire of Systematic Family Dynamic
4. Discussion

4.1 Main findings

Our findings support previous studies\(^\text{12}\) that report abnormal functioning in the families of children with ADHD. Using a scale specifically designed to assess family dynamics in Chinese families, children with ADHD report that the overall functioning in their families is poorer than that reported by children of the same age and gender who do not have ADHD. The differences were most marked in their assessment of the Family Atmosphere dimension – reflecting families that are less relaxed, less cheerful and more authoritarian – but the ADHD children also reported less individuation (i.e., independence from parents) and less moral absolutism in their families. Most of these differences persisted after adjusting the results for the educational level of the parents and the economic status of the family.

There are several mechanisms that could explain the connection between ADHD and poor family functioning and decreased individuation. The children’s attention deficit and poor academic performance may cause long lasting disappointment for parents and lead to disagreements about parenting style. The hyperactive and impulsive behavior of the children can lead to trouble at school that parents try to resolve by punishing the children. These changes in family relationships could result in an unhappy and antagonistic family atmosphere. The intellectual and emotional deficits of ADHD children\(^\text{13,14}\) can lead to low self-confidence and, thus, over-reliance on their parents. At the same time their disruptive behavior can cause parents to introduce rigid methods to control their activities. This could result in decreased age-appropriate independence of the children and resentment of parental restrictions.

4.2 Limitations

The reported differences in the families of children with ADHD and control families are based on the reports of children 10 to 17 years of age. Comparison of the children’s assessments of family functioning to those of their parents is needed to evaluate the validity of the children’s assessments. Moreover, the internal consistency of the four dimension scores of the main instrument used in the study to assess family dynamics (α=0.44-0.53) were poorer in this sample of children than previously reported for adult respondents\(^\text{8}\) (α=0.67-0.87). Thus the reliability and validity of the scale

| Table 4. Multiple regression of total and dimension scores of the Questionnaire of Systemic Family Dynamics |
|---------------------------------|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Dependent variable | Independent variables | B | se | 95% CI for B | Beta | t-value | p-value |
| Good vs. Bad | Higher paternal education | -0.63 | 1.73 | -4.08~2.82 | -0.06 | -0.36 | 0.717 |
| | Higher maternal education | -0.34 | 1.45 | -3.22~2.54 | -0.03 | -0.24 | 0.814 |
| Family Atmosphere\(^a\) | Increasing family income | -0.96 | 1.09 | -3.12~1.20 | -0.11 | -0.88 | 0.381 |
| | Patient group | 6.50 | 1.83 | 2.87~10.13 | 0.36 | 3.56 | 0.001 |
| Individuation vs. Symbiosis\(^b\) | Higher paternal education | 1.38 | 1.25 | 1.10~3.86 | 0.18 | 1.11 | 0.272 |
| | Higher maternal education | -1.22 | 1.04 | -3.29~0.85 | -0.18 | -1.17 | 0.244 |
| | Increasing family income | 0.37 | 0.78 | -1.19~1.92 | 0.06 | 0.47 | 0.639 |
| | Patient group | 3.15 | 1.31 | 0.54~5.76 | 0.25 | 2.40 | 0.018 |
| Moral Absolutism vs. Moral Relativism\(^c\) | Higher paternal education | -0.11 | 0.87 | -1.84~1.61 | -0.02 | -0.13 | 0.896 |
| | Higher maternal education | -1.22 | 0.73 | -2.66~0.23 | -0.25 | -1.68 | 0.097 |
| | Increasing family income | 0.04 | 0.54 | -1.05~1.12 | 0.01 | 0.06 | 0.949 |
| | Patient group | 1.75 | 0.91 | -0.66~3.57 | 0.20 | 1.92 | 0.058 |
| Personal responsibility vs. other causes for Psychological Problems\(^d\) | Higher paternal education | 0.23 | 0.69 | -1.15~1.60 | 0.06 | 0.33 | 0.746 |
| | Higher maternal education | -0.37 | 0.58 | -1.51~0.78 | -0.10 | -0.64 | 0.527 |
| | Increasing family income | -1.12 | 0.43 | -0.98~0.74 | -0.04 | -0.27 | 0.790 |
| | Patient group | 0.59 | 0.73 | -0.86~2.03 | 0.09 | 0.81 | 0.422 |
| TOTAL SCORE\(^e\) | Higher paternal education | 0.86 | 3.24 | -5.58~7.30 | 0.04 | 0.27 | 0.792 |
| | Higher maternal education | 3.15 | 2.71 | -8.33~2.93 | -0.17 | -1.16 | 0.248 |
| | Increasing family income | 0.67 | 2.03 | -4.70~3.36 | -0.04 | -0.33 | 0.742 |
| | Patient group | 11.99 | 3.41 | 5.22~18.76 | 0.36 | 3.52 | 0.001 |

\(^a\) R=0.405, R\(^2\)=0.164, F=4.27, p=0.003;  
\(^b\) R=0.317, R\(^2\)=0.100, F=2.42, p=0.054;  
\(^c\) R=0.334, R\(^2\)=0.111, F=2.73, p=0.034;  
\(^d\) R=0.133, R\(^2\)=0.018, F=0.39, p=0.815;  
\(^e\) R=0.406, R\(^2\)=0.165, F=4.29, p=0.003.
when completed by children need to be assessed further by comparing the results with other measures of family functioning.

We were able to control for the age and gender of the children and to adjust the results for the potential effect of parental education and the economic level of the family, but the relatively small sample size made it impossible to adjust for other potential confounders such as the duration and severity of ADHD or to conduct stratified analyses by age and gender.

This is a cross-sectional study so it is not possible to determine the causal relationship between ADHD and abnormal family dynamics. Abnormal family dynamics could be a response to the occurrence of ADHD in a child, but it is also possible that underlying family problems precipitate or exacerbate ADHD. Prospective studies of family functioning will be needed to clarify the causal relationship between these variables.

4.3 Significance

This preliminary study on the family dynamics of families with children that have ADHD in China finds that children with ADHD are more likely to report a poor family atmosphere and less independence than children of the same age and gender who do not have ADHD. Further work is needed to validate the methods for assessing family dynamics in Chinese families, particularly when using children as informants, but this method provides valuable information that can be used as the focus of family therapy that can augment traditional pharmacological and behavioral approaches to the treatment of ADHD.

Conflict of interest

The authors report no conflict of interest related to this paper.

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注意缺陷与多动障碍儿童的家庭动力学研究

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摘要

背景 对注意缺陷与多动障碍需要辅于家庭治疗，开展这一辅助治疗就要求详细了解这些家庭的动力学特征。

目的 探讨注意缺陷与多动障碍（Attention Deficit Hyperactivity Disorder，ADHD）儿童的家庭动力学特征。

方法 采用 19 项的系统家庭动力学自评量表（Questionnaire of Systematic Family Dynamics，QSFD）对就诊于南京脑科医院的 46 例ADHD患儿（10~17岁）和 46 名性别、年龄相同的对照学生的家庭动力进行评估。该量表评估家庭功能的4个维度：家庭气氛、个性化、系统逻辑以及疾病观念。

结果 两组的疾病观念无明显差异。ADHD组患儿报告家庭氛围不佳，个性化程度低，家庭内更多使用“非此即彼”的绝对化逻辑。父母的受教育程度和家庭经济状况可能影响结果，校正了上述混杂因素的影响后，家庭氛围不佳和个性化程度低在ADHD患儿中仍有统计学意义。患儿自评的QSFD问卷4个维度的内部一致性欠佳（α=0.44~0.53）。

结论 该研究初步调查了ADHD患儿的家庭动力学特征，结果显示，患儿报告的家庭气氛更显沉闷，家庭成员间情感和行为的分化程度低。今后需要进一步开展工作，以提高中国家庭动力学评估方法的效度，尤其是将孩子作为信息来源。尽管如此，在传统的药物治疗和行为治疗基础上对ADHD患儿辅以家庭治疗时，本研究的评估方法还是提供了有用的信息。

Erratum

The correspondence e-mail address for the original article entitled ‘Cross-sectional assessment of the factors associated with occupational functioning in patients with schizophrenia’ published in the fourth issue of the 2012 volume [Shanghai Arch Psychiatry 2012; 24(4): 222-230.] should be changed to the following: rhdeng88@hotmail.com. The editors apologize for this mistake.