The correlation analysis between childhood behavioral disturbance and maternal alexithymia: an observational study

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Research Article

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Abstract

Background

From the perspective of children's psychological development and psychoanalysis, the primary caregiver's response to children's behavior has a considerable impact on children's emotional and behavioral development. If caregivers lack the ability to empathize, difficulties in detecting and responding to children's emotions, which may lead to children's emotional and behavioral disorders. The purpose of this study is to preliminarily explore the correlation between children's behavioral and emotional disorders and the mother's inability to express emotions.

Method

We collected a total of 78 cases from outpatient clinics, aged between 3–13 years old. The Taiwan version of the "Toronto Alexithymia Scale" and "Children's Behavior Checklist" questionnaires were used as research tools, which were filled out by the mothers themselves. We use Spearman correlation tool for follow-up analysis.

Results

The factor 1, 2 and 3 of TAS are positively correlated with somatic complaint subscale of CBCL. (F2: p < 0.01; F1 and F3: p < 0.05); The factor 1 of TAS is positively correlated with internal subscale of CBCL (p < 0.05) and withdrawn subscale of CBCL (p < 0.05). We found significant associations TAS-Total and the SC subscale of CBCL (p < 0.05), and factor 1 of TAS and WD of CBCL on boy alone (p < 0.05). However, negative related association was noted between TAS-F3 and the SP subscale of CBCL (p < 0.05).

Conclusion

We infer that when mothers are less able to distinguish internal emotional feelings, children's emotions and behaviors tend to be internalized, and they are more likely to show withdrawal, complaints of physical discomfort, and depression and anxiety. In addition, boys tend to show withdrawal traits in the internalization dimension; girls tend to show depression and anxiety in that respectively. This study preliminarily shows that there is a partial correlation between mother's alexithymia and children's emotional and behavioral disorders, and it is worth further exploring the impact of caregivers' emotional traits on children's growth in the future.

Introduction

Current view in development holds that personality development gradually takes shape in the midst long-term interaction between the innate temperament and the acquired environmental in the early years of life. Children's behaviors are not only the expression of their innate temperaments but also greatly attributable to the environment, the influence from the family, in particular [1].

According to the theory of object-relationship and self psychology, for childhood development, the ability of primary care-giver (usually the mother) to contain and respond to children's emotions and behaviors greatly affects if children can develop healthy. Previous clinical studies and observations revealed that the psychopathology of
primary care-giver can have an effect on the mental health of the children under care when they become adults and even result in intergenerational inheritance [2].

Past studies of parents’ personality traits and psychopathology seldom paid attention to the influence of alexithymia. The alexithymia concept is derived from researches toward patients with psychosomatic disorders. It is regarded as an emotional dysregulation. According previous study, there is an inverse relationship between alexithymia and empathy ability [3], and it means when a person cannot sense his own emotions, he may also experience difficulty empathizing with others.

A study of borderline personality disorder in women and their interpersonal relationships indicates that “impairment of early attachment is at least partly attributable to a lack of empathic parenting” [4]. Therefore, lacking the ability to empathize with others may make it difficult for a care-giver to notice and respond to the emotions of children under care, which accordingly results in emotional and behavior disorders in the children.

**Alexithymia**

The alexithymia construct is defined by Nemiah and Sifneos et al. [5] in the early 1970s. The salient features of the construct are: 1) difficulty identifying and describing subjective feelings; 2) difficulty distinguishing between feelings and the bodily sensations of emotional arousal; 3) constricted imaginal capacity, as evidenced by a paucity of fantasies; and 4) an externally oriented cognitive style [6–9]. The alexithymia construct reflect deficits in the cognitive processing and regulation of emotions. These deficits are considered as an important mechanism that causes mood disorders and psychosomatic disorders.

There were few studies to investigate the influence of mother’s alexithymia on the children's behavioral problems in the past.

We collected comprehensive data from pediatric psychiatric outpatient department with children's ages between 3 to 13 year old. We hypothesized that it was difficult for a care-giver to notice and respond to the emotions of children under care due to lacking the ability to empathize with others, which may result in emotional and behavior disorders in the children. As a result, we explored the correlation between children's behavioral disturbance and alexithymic features of their mothers.

**Method**

This research project is an observational study. Data was collected from the mothers of children who were referred from pediatric psychiatric outpatient department in Veteran General Hospital-Taichung for psychological evaluation from 2008 to 2009. Children's ages were between 3 to 13 year old. Children with organic brain lesions were excluded. Most of the children were suspected to have attention deficit and learning difficulties. Chinese version of TAS-20 was used for evaluation of mother’s alexithymic features and CBCL was used for evaluation of the children's emotional and behavioral disturbance. The TAS-20 and CBCL questionnaires were completed by the mothers independently without other professional guide.

The study protocol was approved by The Institutional Review Board of Taichung Veterans General Hospital/ C07239 and each study site was granted approval from the local research ethics committee. Written informed consent was obtained from each participant and his or her guardian. All methods were performed in accordance with the relevant guidelines and regulations. Spearman correlation analysis of SPSS were used for data analysis.
Instruments

To assess children's behavioral disturbance noted from their mother and alexithymic features of them from pediatric psychiatric outpatient department, items to capture children's behavioral disturbance and their mother's alexithymia features were designed as below:

**Toronto Alexithymia Scale**

In the past, because of the lack of quantitative research tools and rating scale, there are few studies about Alexithymia. Among contemporary research tools for measuring alexithymia, the Toronto Alexithymia Scale developed by Taylor et al. in 1990 has the optimal internal consistency and factor structure. [7, 10] Further in 1994, it is revised to TAS-20 and is the most widely used tool in studies of Alexithymia currently. The Questionnaire contains 20 narrative sentences and is divided into three factors structure, including (1) factor 1- difficulty identifying feelings and distinguishing them from the somatic sensations that accompany emotional arousal; (2) factor 2-difficulty communicating feelings to other people; and (3) factor 3-externally oriented thinking. About the other factor-"lack of internal fantasy life" in original definition, researchers find that it lacks enough correlation of overall questionnaire, and it has high correlation with social needs in the questionnaire development process. Further factor analysis results showed that a 3-factor model rendered better validity than a 4-factor model [11, 12]. By the end of 2003, TAS-20 had been translated into 18 languages and been completed confirmatory factor analysis in 19 different cultural regions, indicating that it has optimal cross-language consistency and a steady 3-factor structure [13].

Dr Yu-Chen Lin, MD, completed the Chinese version of TAS-20 in his study in 2003 and names it as “Taiwanese version of the Toronto Alexithymia Scale” to be the tool for studying the Taiwanese population [14]. In this study, we use the Taiwanese version of the Toronto Alexithymia Scale to assess the alexithymic features of the primary caregivers of the children.

**Child Behavior Checklist**

Child Behavior Checklist-CBCL is developed by Professor Thomas M. Achenbach, United States. [15] The Child Behavior Checklist's (CBCL) is often used as a screening instrument at first contact in standard child and adolescent psychiatric settings adding valuable information to the diagnostic process. The CBCL is an instrument widely used to evaluate various aspects of children's behavior observed by parents. It could be rating by parents or family primary caregivers to fulfill and rate the behavior performance of the children ranging from 4–18 years old in the past six months [16].

The Chinese version of the CBCL was standardized in 1994. Its validity and reliability are well established in Taiwan [17]. It consists of a 118-item parent-report questionnaire. Parents are asked to indicate whether each item is very true, somewhat true, or not true of their child. Resulting data are entered on a child behavior profile. The CBCL provides a Total Behavioral Problem score, two second-order factor scores (externalizing problems and internalizing problems), and 8 syndrome scale scores (somatic complaints-SC, anxious/depressed-AD, thought problems-TP, social problems-SP, withdrawn-WD, delinquent behavior-DB, aggressive behavior-AB, and attention problems-AP). The externalizing behaviors (aggression, delinquency, and hyperactivity) refer to a group of behavioral problems that are manifested in children's outward behavior and reflect the child acting negatively on the external environment. In contrast, internalizing behavioral problems such as withdrawn, anxious, inhibited, and depressed behavior, more centrally affect the child's internal psychological environment rather than the external world.
A child is scored on the above scale according to CBCL norms for age and sex. Scores equal to or above the 98th percentile for controls are considered abnormal.

In this study, the Chinese version of the CBCL was completed by the primary caregivers (most the mothers) of each child at our outpatient clinic. The CBCL was rated by a trained research assistant who was blind to the clinical history of the participants.

**Statistical analyses**

First, we evaluated all items from the TAS and CBCL. Second, all analyses were performed in SPSS. To investigate whether children's behavioral disturbance and their mother's alexithymia features would be correlated to each categorical analysis were performed. Modality of association between two variables was exhibited by Spearman correlation test. Statistical significance was determined as or below 0.05 level (2-tailed). We check the correlation between the three included alexithymia trait variables and the nine included Child Behavior trait variables using Spearman correlation.

**Result**

Total 78 cases were included with average of 8.9 ± 2.5. There are 62 boys with mean age of 8.9 ± 2.5 and 16 girls with mean ages of 8.1 ± 2.9. The mean ages of boys and girls did not show statistically significant differences. Most of the children were suspected to have attention deficit and learning difficulties.

The mean TAS total score of the mothers is 46.4 ± 10.2. The score is slightly higher in mothers with boys than mothers with girls but there was no significant analytic difference found by children's sex difference. (Table 1)

The mean CBCL total score of the children is 48.7 ± 25.0. The score of CBCL of girls is slightly higher than boys' but there is no significant analytic difference. No statistical difference was observed between boys and girls in the mean scores of individual subscales, either. (Table 1)
<table>
<thead>
<tr>
<th></th>
<th>Total (N=78)</th>
<th>Girls (N=16)</th>
<th>Boys (N=62)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>8.9 ± 2.5</td>
<td>9.2 ± 2.4</td>
<td>8.1 ± 2.9</td>
</tr>
<tr>
<td>TASF_1</td>
<td>15.4 ± 5.2</td>
<td>14.8 ± 5.0</td>
<td>15.5 ± 5.3</td>
</tr>
<tr>
<td>TASF_2</td>
<td>11.8 ± 3.8</td>
<td>10.6 ± 3.1</td>
<td>12.1 ± 3.9</td>
</tr>
<tr>
<td>TASF_3</td>
<td>19.2 ± 3.6</td>
<td>17.9 ± 3.1</td>
<td>19.6 ± 3.7</td>
</tr>
<tr>
<td>TASF_Total</td>
<td>46.4 ± 10.2</td>
<td>43.3 ± 9.2</td>
<td>47.2 ± 10.4</td>
</tr>
<tr>
<td>WD</td>
<td>3.9 ± 2.7</td>
<td>4.8 ± 3.0</td>
<td>3.6 ± 2.6</td>
</tr>
<tr>
<td>SC</td>
<td>2.0 ± 2.5</td>
<td>2.4 ± 2.3</td>
<td>1.9 ± 2.6</td>
</tr>
<tr>
<td>AD</td>
<td>6.4 ± 5.7</td>
<td>8.0 ± 5.7</td>
<td>6.0 ± 5.7</td>
</tr>
<tr>
<td>SP</td>
<td>5.53 ± 3.5</td>
<td>6.3 ± 3.5</td>
<td>5.3 ± 3.4</td>
</tr>
<tr>
<td>TP</td>
<td>2.04 ± 1.9</td>
<td>2.4 ± 1.8</td>
<td>1.9 ± 2.0</td>
</tr>
<tr>
<td>AP</td>
<td>9.27 ± 3.8</td>
<td>10.4 ± 4.4</td>
<td>9.0 ± 3.6</td>
</tr>
<tr>
<td>DB</td>
<td>3.53 ± 2.6</td>
<td>3.6 ± 2.8</td>
<td>3.5 ± 2.6</td>
</tr>
<tr>
<td>AB</td>
<td>11.2 ± 6.4</td>
<td>12.5 ± 6.5</td>
<td>10.9 ± 6.4</td>
</tr>
<tr>
<td>INT</td>
<td>12.1 ± 9.1</td>
<td>14.9 ± 8.8</td>
<td>11.4 ± 9.1</td>
</tr>
<tr>
<td>EXT</td>
<td>14.7 ± 8.5</td>
<td>16.1 ± 8.4</td>
<td>14.4 ± 8.6</td>
</tr>
<tr>
<td>CBCL_total</td>
<td>48.7 ± 25.1</td>
<td>56.3 ± 25.7</td>
<td>46.8 ± 24.7</td>
</tr>
</tbody>
</table>

WD withdrawn, SC somatic complaints, AD anxious/depressed, SP social problems, TP thought problems, AP attention problems, DB delinquent behavior, AB aggressive behavior, INT internalizing problems, EXT externalizing problems
Table 2
Correlation analysis between TAS score and CBCL score

<table>
<thead>
<tr>
<th></th>
<th>TAS-F1</th>
<th>TAS-F2</th>
<th>TAS-F3</th>
<th>TAS-total</th>
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<tbody>
<tr>
<td>WD</td>
<td>0.228*</td>
<td>0.120</td>
<td>-.104</td>
<td>.093</td>
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<tr>
<td>SC</td>
<td>.330**</td>
<td>.342**</td>
<td>.240*</td>
<td>.353**</td>
</tr>
<tr>
<td>AD</td>
<td>.131</td>
<td>.043</td>
<td>-.134</td>
<td>.021</td>
</tr>
<tr>
<td>SP</td>
<td>-.111</td>
<td>-.137</td>
<td>-.171</td>
<td>-.125</td>
</tr>
<tr>
<td>TP</td>
<td>.118</td>
<td>-.011</td>
<td>-.129</td>
<td>-.001</td>
</tr>
<tr>
<td>AP</td>
<td>-.195</td>
<td>-.101</td>
<td>-.194</td>
<td>-.180</td>
</tr>
<tr>
<td>DB</td>
<td>.141</td>
<td>.070</td>
<td>-.045</td>
<td>.060</td>
</tr>
<tr>
<td>AB</td>
<td>-.031</td>
<td>-.083</td>
<td>-.120</td>
<td>-.104</td>
</tr>
<tr>
<td>INT</td>
<td>.262*</td>
<td>.155</td>
<td>-.045</td>
<td>.147</td>
</tr>
<tr>
<td>EXT</td>
<td>.018</td>
<td>-.046</td>
<td>-.112</td>
<td>-.064</td>
</tr>
<tr>
<td>CBCL_total</td>
<td>.082</td>
<td>.004</td>
<td>-.082</td>
<td>-.001</td>
</tr>
</tbody>
</table>

Table 3
Correlation analysis between TAS score and CBCL score in boys and girls separately

<table>
<thead>
<tr>
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<tr>
<td>WD</td>
<td>.290*</td>
<td>.140</td>
<td>.195</td>
<td>-.123</td>
<td>-.069</td>
<td>-.055</td>
<td>.153</td>
<td>-.014</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td>.300*</td>
<td>.541*</td>
<td>.372**</td>
<td>.338</td>
<td>.271*</td>
<td>.358</td>
<td>.361**</td>
<td>.466</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AD</td>
<td>.094</td>
<td>.382</td>
<td>.058</td>
<td>.066</td>
<td>-.187</td>
<td>.338</td>
<td>.015</td>
<td>.350</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP</td>
<td>-.147</td>
<td>.107</td>
<td>-.122</td>
<td>-.183</td>
<td>-.264*</td>
<td>.289</td>
<td>-.173</td>
<td>.125</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP</td>
<td>.144</td>
<td>.193</td>
<td>.010</td>
<td>.005</td>
<td>-.117</td>
<td>.011</td>
<td>.004</td>
<td>.091</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>AP</td>
<td>-.060</td>
<td>.098</td>
<td>-.112</td>
<td>.118</td>
<td>-.167</td>
<td>.159</td>
<td>-.154</td>
<td>.159</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>DB</td>
<td>.138</td>
<td>.139</td>
<td>.101</td>
<td>-.117</td>
<td>.116</td>
<td>.283</td>
<td>.152</td>
<td>.282</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>INT</td>
<td>.260*</td>
<td>.382</td>
<td>.195</td>
<td>.053</td>
<td>-.062</td>
<td>.235</td>
<td>-.039</td>
<td>.274</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>EXT</td>
<td>-.005</td>
<td>.101</td>
<td>-.056</td>
<td>.033</td>
<td>-.170</td>
<td>.198</td>
<td>-.110</td>
<td>.160</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>CBCL_total</td>
<td>.062</td>
<td>.266</td>
<td>.012</td>
<td>.027</td>
<td>-.139</td>
<td>.306</td>
<td>-.039</td>
<td>.274</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** P value < 0.01 (2-tailed)
* P value < 0.05 (2-tailed)
About the correlation of Mothers’ TAS and CBCL, this is not significantly different in total scores when we analysis total samples (n = 78). The factor 1,factor 2,factor 3 and total scores of TAS are all positively correlated with somatic complaint subscale of CBCL (F1& SC: b = 0.33, p < 0.01; F2& SC: b = 0.342, p < 0.01; F3& SC: b = 0.240, p < 0.05; TAS-total & SC: b = 0.353, p < 0.01). The factor 1 of TAS is also positively correlated with internal subscale of CBCL (b = 0.262, p < 0.05) and withdrawn subscale of CBCL (b = 0.228, p < 0.05). (Table 2)

When girls were tallied alone, there were no significantly correlation between TAS and CBCL. When boys were tallied alone, Factor 1 of TAS and the WD subscale of CBCL were significantly positive correlation (b = 0.25; p < 0.05), and TAS-Total and the SC subscale of CBCL were also significantly positive correlation (b = 0.28; p < 0.05). However, negative correlation was noted in subgroup of boys between TAS-F3 and the SP subscale of CBCL (b=-0.264, p < 0.05) (Table 3)

**Discussion**

The result of this study reveals there is no significant analytic difference of the correlation between mothers’ TAS total score and children's CBCL total score. This indicates there is no significant correlation between overall children's behavioral problems and the mother's inability of emotional expression, so we speculate that mother's inability of emotion identification and expression does not have extensive impact on the overall range of children's behavioral problems.

In this study, TAS total score has positive correlation with the SC sub-score of CBCL. The SC sub-score of CBCL also has positive correlation with all divided factors of TAS. This result indicates the mother's inability of emotion identification and expression has strong impact on the degree of children's somatic complaints. Alexithymia has the tendency of somatization [18, 19] and this result echoes some results of studies that alexithymia may be the phenomenon of intergenerational transmission [20]. Furthermore, children with somatic complains tends to having alexithymia. [21] Whether the child learn the emotional regulation model from their care-givers who have difficulty in emotion identification and expression to use somatic complaints as a way of coping stresses in the process of development, or this is because that there is a biological hereditary tendency on the in this phenomenon [2]. It is worthy of further study to deal with this question.

To analysis the correlation between every TAS sub-score of mothers and every CBCL sub-score, we also find that there is statistically significantly positive correlation between mothers' TAS-factor 1 and children's withdrawn and internalization dimension of CBCL scores, but there is no correlation with externalization dimensions. This result reveals that mothers’ inability of distinguish inner emotion has results in that children's tend to have more internalization behavioral problems such as withdrawn, somatic complaints and anxiety / depression but not increase externalization behavioral problems. [21, 22] Another possibility was children with more internalization behavior problems would have a tendency to be alexithymic and decrease the probability of externalization.[23]

There has difference of CBCL scores performance between boys and girls in general population. [16] In previous studies, boys have significantly higher rates of externalizing problems than girls almost in every culture [24]. According to this reason, we analysis boys and girls separately to see if caregiver's alexithymic feature has different impact on the behavioral problems between boys and girls. Although mother's difficulty in distinguishing inner emotion( high TAS-factor 1 score) has impact on child's internalization dimension both in boys and girls, the boys have high tendency to show withdrawal and somatic problems in internalization dimension.
The result of negative correlation between TAS factor 3 and CBCL SP subscale in boy is difficult to explain its clinical meanings. The study group included mainly ADHD and learning disability which usually has more social difficulty. Mother's evaluation about child's social problems might be interfered or unstable. Although alexithymia may be related to social problems faced by autistic and non-autistic children[25], Top, E et al. found that families’ alexithymic status and social skill levels may affect their children's orientation to sport [26]. This phenomena maybe explained that mother could escape from the problem and spend their own comfortable time as their children doing something else. So children's social problems were underestimated by their mothers. However, to support this view, we need to expand the sample size to confirm this result in the future.

**Strengths and limitations**

This study has several limitations: (1)Because of small sample size, we could not do further control variances in demographic date among care-givers and children; (2) It is difficult to assess the quality and quantitative of interaction between care-givers and children; (3) Most of children are diagnosed with ADHD, the result of CBCL may result from ADHD-biological influence, but not from the consequence of the parent-child interaction; (4) TAS and CBCL scale are both completed by the mother. If the somatization tendency mother will pay more attention toward child's somatic complaints and then result in this result. This needs further clarification. Future research may need to sample in the community and larger samples size to minimize the influence of intrinsic underlying psychopathology (such as Attention deficit hyperactivity disorder), and to have better control of variables.

**Conclusion**

In this preliminary study, the result shows that there is positive correlation between care-givers alexithymic feature and children's internalization behavioral problems, especially in somatic complaints. Besides, this impact is more significantly in boys. This is worthy as a base about further study to investigate the impact of care-givers’ emotional regulation characteristics on child’s development.

**Abbreviations**

TAS: Toronto Alexithymia Scale ;CBCL: Children's Behavior Checklist; ADHD: Attention Deficit Hyperactivity Disorder; WD: Withdrawn; SC: Somatic complaints; AD: Anxious/depressed; SP: Social problems; TP: Thought problems; AP: Attention problems; DB: Delinquent behavior; AB: Aggressive behavior; Sex P: Sex problems; INT: Internalizing problems; EXT: Externalizing problems

**Author contributions**

YCL collected and analyzed data, prepared tables, and wrote the manuscript. WYL was responsible for the supervision of this project. All authors read and approved the final version of the manuscript.

**Declarations**

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Availability of data and materials

Available from the corresponding author on reasonable request.

Ethics approval and consent to participate

The study protocol was approved by The Institutional Review Board of Taichung Veterans General Hospital/ C07239 and a doctoral level researcher or a member of the clinical research team obtained written informed consent. Written informed consent was obtained from each participant and his or her guardian.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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