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Chapter 8

Child Dental Fear and General Emotional Pro- blems: a Pilot Study



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Abstract

Aim

This was to investigate the relation between general emotional and behaviour problems of the child and dental anxiety and dental behaviour management problems.

Background

Dental treatment involves many potentially unpleasant stimuli, which all may lead to the development of dental anxiety and behaviour management problems (DBMPs). It is still unclear why some children get anxious in the dental situation while others, with a comparable dental history, do not. Besides the latent inhibition theory it is suggested that this can be explained by differences in child rearing and personality traits.

Design and methods

Fifty children (4-12 years old) and their parents participated in this study. Parents filled out the Child Fear Survey Schedule Dental Subscale (CFSS-DS) and the Child Behaviour Checklist (CBCL) on behalf of their child. Child behaviour during consecutive dental treatments was assessed using the Venham scale.

Results

Thirty-nine children were subject to analysis (21 boys) with a mean CFSS score of 40.4. Children aged 4 and 5 who had sleeping problems, attention problems and aggressive behaviour, scored by parents on the CBCL, displayed more disruptive behaviour during dental treatment. Children with emotionally/ reactive and attention problems were more anxious.

Conclusion

In this pilot study a possible relation between general emotional and behaviour problems of young children and dental anxiety was shown. Also a relation between emotional and behaviour problems and dental behaviour management problems was shown. Because of the little amount of subject in our study, further research will be needed to confirm these results.

Introduction

Restorative dental treatment may be a stressful situation for a child. It contains a variety of potentially unpleasant stimuli, and each may lead to the development of dental fear and associated behaviour management problems (DBMPs). In the literature different pathways for the development of dental fear have been described [Rachman, 1977; de Jongh et al., 1995; Klingberg et al., 1995; ten Berge et al., 2002a]. Rachman [1977] has proposed that although fears are often acquired directly, they may also be acquired through two other pathways: vicarious experiences or threatening information. Retrospective research contributes the origin of dental fear most often to the first pathway: direct conditioning [Davey, 1989; de et al., 1995]. However, research has indicated that invasiveness of dental treatment seems to play a lesser role in children's fear acquisition than the way in which a child experienced it [Klingberg et al., 1995; ten Berge et al., 2002a].

Dental fear is strongly associated with behaviour management problems (DBMPs) [Klingberg et al., 1995] being the most common reason for referral to a secondary dental care clinic [ten Berge et al., 1999]. The question remains why some children tend to get frightened and exhibit DBMPs, whereas others with seemingly comparable dental experiences do not. One reason is provided by the latent inhibition theory whereby children tend to become less afraid if they had more neutral visits (e.g. check-up, cleaning) before exposure to invasive dental treatments (e.g. fillings, extractions) [Davey, 1989; ten Berge et al., 2002a]. Another reason for the acquisition of dental fear could be a general anxious trait. When someone is afraid of a variety of stimuli, it could also increase the likelihood to develop dental fear. In adults dental fear has been shown to be related to various fears such as the fear of heights, flying, and enclosures [Fiset et al., 1989].

It is suggested that parents play an important role in teaching their children to deal with aversive situations [Hardy et al., 1993]. In general family environment factors such as parental rearing and attachment style are said to contribute to the severity of anxiety symptoms in children. In contrast to these external, environmental reasons for the development of dental fear are the internal reasons, e.g. the personality traits of the child itself. Children with a frightened constitution (e.g. trait anxiety) are in greater risk to become dentally fearful. From the literature we know that 6% of Dutch children are known to have high dental fear (CFSS-scores above 39), another 8% of the Dutch children also suffer from some degree of dental fear or may be at risk for developing high dental fear (CFSS-scores between 32-39) [ten Berge et al., 2002a]. Children referred to a special dental care centre not only suffer from high dental fear but also have problems in several other behaviour and emotional areas [ten Berge et al., 1999]. Some personality traits and the socio-emotional or cognitive development of children are important factors in the development of dental fear in children [Brown et al., 1986; Klingberg & Broberg, 1998]. It would be worthwhile to know before any (possibly anxiety provoking) treatment is done which personality traits make children at risk of becoming frightened. Studies on this issue mainly have been done retrospectively, including the risk of retrospective

attribution, thereby linking the wrong reason to dental fear. A prospective study on the assessment of this problem may be helpful in the diagnosis of dental fear, selecting the appropriate treatment strategy for this children. In this study the relationship between emotional and behaviour problems, dental fear and dental behaviour problems displayed during dental treatment was investigated.

Material and Methods

Subjects and procedure

This study was conducted among 50 children aged between 4-12 years old. All children were referred, by their family dentist or physician, to the Centre for Special Dental Care in Amsterdam (SBT) because of dental fear and/or dental behaviour management problems. Only children with dental decay needing at least two consecutive restorative sessions were selected. Children with known psychological or behaviour problems or mental disabilities were excluded. After selection, the parents were informed about the study by letter and were asked to participate. Participation was fully voluntarily and not conditional for treatment. This study was approved by the medical ethical committee of the Free University of Amsterdam (ref. 06/164).

After referral to the centre, before treatment was started, the parents of the children were asked to complete the Dutch parental version of the Child Behaviour Checklist (CBCL) [Verhulst et al., 1996] and the Dental Subscale of the Child Fear Survey Schedule (CFSS-DS) [Scherer & Nakamura, 1968] on behalf of their children, in order to provide more information on the child's dental fear and concomitant emotional and behaviour problems.

All children were treated in consecutive appointments by the same experienced paediatric dentist, who took not place in the selection procedure. A series of appointments always started with a habituation session, used to re-introduce dentistry to the children and fear reduction. The dentists were asked to rate the behaviour displayed by the children during the first 3 dental visits on a Venham scale. The operating dentist was unaware of the results of the CFSS-DS and the CBCL filled out prior to treatment.

Measures

The children's dental fear was screened using the Dutch parent's version of the Dental Subscale of the Children's Fear Survey Schedule (CFSS-DS) [Cuthbert & Melamed, 1982; ten Berge et al., 2001]. The CFSS-DS is a revised form of the Fear Survey Schedule for Children (FSS-FC) developed to assess dental fear in children [Scherer & Nakamura, 1968]. The Questionnaire consists of 15 items related to different aspects of dental treatment. The items can be answered on a 5-point scale from 1 "not afraid at all" to 5 "very afraid". Total scores thus range from 15 to 75. Parents have been found to be well able to assess their child's level of dental fear by using the CFSS-DS [Klingberg et al., 1994]. Normative studies have reported

a CFSS-DS score of around 38 to be indicative of high dental fear in children [Klingberg et al., 1994; Milgrom et al., 1994]. All parents were asked to rate their own level of dental fear on a 5-point scale.

The emotional and behavioural problems of the children were assessed using the Child Behaviour Check List [Achenbach, 1991; Verhulst et al., 1996]. The CBCL is a well known instrument to assess these problems in the 6-months immediately prior to the completion of the questionnaire. Extensive research has shown satisfactory psychometric properties of the CBCL [Verhulst et al., 1996]. The validity of the scale is also acceptable; for example, correlations with other questionnaires such as problem checklists and parent questionnaires were reported ranging from 0.59 to 0.88 [Verhulst et al., 1996]. The CBCL is divided into "competence" and "problem" scales. As the "competence scales" have little relevance for this study on the investigation of different types of problem behaviour in children, in this study only the "problem" scales were used. These problem scales are derived from different areas of problem behaviour using a factor analysis [Achenbach, 1991] emotionally reactive, anxious/depressed, somatic complaints, withdrawn, sleep problems, attention problems and aggressive behaviour.

The behaviour each child displayed during treatment was assessed with the Venham scale, a Likert type behaviour rating scale ranging from 0) "relaxed" to 5) "out of contact". [Venham et al., 1980]. The scale has known validity and reliability [Veerkamp et al., 1995; Aartman et al., 1998]. Initially developed for preschool children the scale proved to work very well for the next (older) age groups after minor modifications [Veerkamp et al., 1991]. The anxiety and behaviour section were merged based on their high internal correlations [Veerkamp et al., 1995]. Because not all children were treated for the same number of sessions, only the Venham scores of the habituation session and of the first two treatment sessions were used for analyses. The mean and highest Venham scores of the sessions were used for analysis.

Data analysis

In this study the CBCL questionnaires were scored by computer, using the Dutch version of the CBCL-manual [Arnold et al., 1993]. In the program the scores of the children were compared with normative data of Dutch children. Mann-Whitney-U tests were used to compare the behaviour of high and low-anxious children and the behaviour between boys and girls. A series of t-tests were performed to assess differences in problem behaviour between boys and girls. Spearman correlation coefficients were assessed for the relation between CBCL-factors and the behaviour children displayed during dental treatment. Pearson correlation coefficients were assessed for the relation between CBCL factors and dental fear of the children. All statistics were performed using SPSS version 17.0 (SPSS Inc, Chicago, IL, USA).

Results

Descriptive statistics

A total of 50 children aged 4-12 years and their accompanying parent or caretaker participated. Eleven CBCL questionnaires contained missing values or were not filled out at all, resulting in 39 subjects for analysis. These were 21 boys (mean age=6.6, $SD=2.5$) and 18 girls (mean age=6.1, $SD=2.4$). There was no difference in age between boys and girls ($p=0.183$). One child had no data on age, and three others had missing values on the CFSS. The questionnaires were mostly filled out by mothers (75%).

Dental anxiety (CFSS): Children were divided into two age groups: young children aged 4 and 5 years (10 girls and 8 boys), and older children aged 6 years and older (7 girls and 13 boys). The average CFSS score was 40.72 (girls 38.2 and boys 42.8, difference n.s. $p=0.351$), range 16-70. Older children were more anxious than young children (45.26 vs 35.65, $p=0.043$).

Behaviour during dental treatment (Venham scale)

Children who scored 39 or more on the CFSS-DS were defined as high-anxious children (HAC); children scoring less than 39 were defined as low-anxious children (LAC). No differences existed between boys and girls in behaviour during the first three appointments (Mann-Whitney-U $p=0.443$). HAC scored significantly higher than low-anxious children LAC, both on the mean Venham- and the Venham peak score (Mann-Whitney U $p=0.023$ and $p=0.011$ resp.). Further analysis on the effects per session showed that this difference was in both scores mainly caused by the behaviour during the habituation session.

Emotional and behavioural problems (CBCL)

No differences were found in problem behaviour between boys and girls. Only young boys scored significantly higher on the CBCL factor sleeping problems (independent samples t-test, $p=0.022$).

Correlations between variables

Clear correlations existed between the CBCL factors emotional problems ($r=0.602$, $p=0.018$), sleeping problems ($r=0.598$, $p=0.019$), attention problems ($r=0.537$, $p=0.039$) and aggressive behaviour ($r=0.523$, $p=0.045$) on one hand, and the behaviour young children exhibited during dental treatment on the other. In addition clear positive correlations existed between the CBCL factors for young children emotionally/ reactive ($r=0.520$, $p=0.039$) and attention problems ($r=0.512$, $p=0.043$) on one hand and the CFSS score on the other.

Discussion

In the present study the relation between emotional and behavioural problems (CBCL), dental fear (CFSS) and dental behaviour management problems (Venham) was investigated.

The mean CFSS-score of the children was 40.7 which is higher than normative scores for the Dutch population (23.9) [ten Berge et al., 2002b] and can be considered as high-anxious (cut off value 39). This was obviously, as all children were referred to the clinic because of dental anxiety and concomitant behaviour management problems. Older children were more anxious than younger children in contrast to the normative data for the Dutch child population. In younger children, referral is mostly attributed to general DBMPs caused by their age. In the older children, coping strategies have been developed to deal with the general anxiety. In older children referral only occurs in case of treatment problems that are commonly caused by specific dental fears (e.g. needle phobia) and exceeding their individual coping abilities, which can explain their higher CFSS scores.

The significant correlations found between the factors emotionally/ reactive and attention problems on one hand and the level of dental anxiety of the children on the other, might indicate that children with more internalising problem behaviour could be at risk of becoming dentally anxious. Similar results were found in girls [Raadal et al., 1995], who had more social and attention problems and more dental anxiety. These internalising children do not show their dental anxiety solely by overt behaviour. The above is in line with earlier research, stating that emotional and behavioural problems co-exist with dental fear [ten Berge et al., 1999]. Also psychological problems such as mood swings, general fearfulness and fearful reactions to everyday situations were related to dental fear [Liddell, 1990; Corkey & Freeman, 1994], or anticipation of/ and dealing with pain of injections [Versloot et al., 2008].

Dental anxiety seems to interfere with a child's behaviour during treatment and its daily behaviour; high-anxious children displayed more disruptive behaviour, especially during the habituation session. Emotional, sleeping and attention problems and aggressive behaviour correlated significantly with the behaviour that children exhibited during dental treatment. These factors are strongly associated with externalising problem behaviour. These children show their distress by overt behaviour (screaming and moving). The CBCL factor attention problems correlated both with the behaviour children displayed during dental treatment and the dental anxiety of these children. Apparently these children are also at a greater risk for developing dental behaviour management problems.

This pilot study was part of a larger study, which caused some concessions on the study design. Therefore some points on the study design need to be criticized. The number of participants in this pilot study was very small, especially because about half of the children were 6 years and older, the age group in which we could not find significant relations. Therefore, it is not possible to draw hard conclusions from our study. Although the behaviour of the children was scored using a standardized scale (Venham) it was rated by the treating dentist. For the treating dentist it will not be possible to be aware of all the (non-verbal) behaviour the child displayed during treatment. Also the interpretation of the behaviour could be influenced by the dentist. Although earlier research indicates that an operating dentist is well able to score a child's fear/anxiety [Veerkamp et al., 1995], dentists tend to underestimate dental pain of the children [Versloot, 2004]. In the general population large variations exist in

CBCL and CFSS scores. Also the behaviour children display during dental treatment varies a lot. In this study of only 39 subjects only an indication can be shown on the correlation between those. Especially because all children were referred to a special dental care clinic because of dental anxiety and its concomitant behaviour management problems.

Conclusion

Although a thorough investigation of the relation between child dental anxiety, child behaviour (problems) during dental treatment and overall daily life behaviours/ experiences of children would be time-consuming for both parents and dental staff, it has been shown in this trial that there are good reasons to perform such studies.

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